The eyes cannot hear nor feel?
A contrastive view on perception verbs in Ancient Egyptian and Kirundi

Emmanuella Ahishakiye & Stéphane Polis

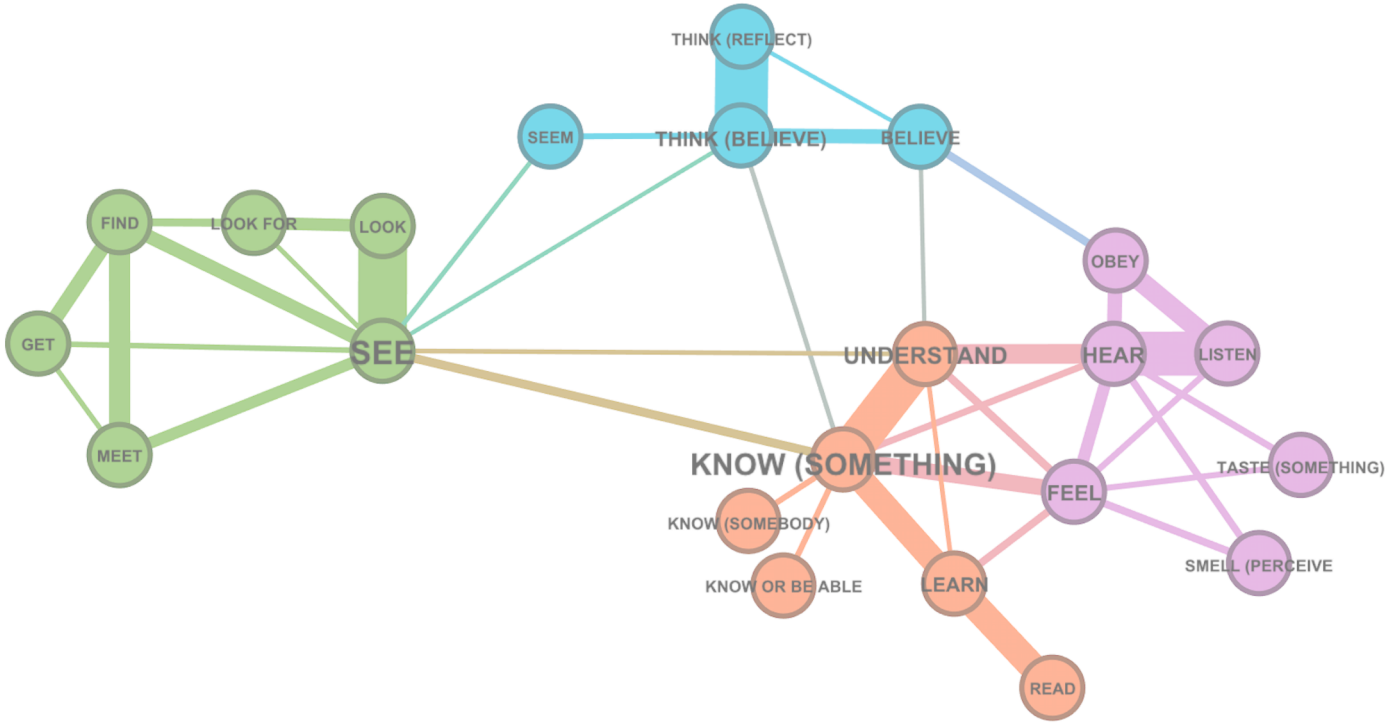
(University of Burundi, University of Liège, F.R.S./FNRS)

Language, Semantics and Cognition:
Saying and conceptualizing the world
from Ancient Egypt to Modern Times

Yale, April 16–18 2021

Goal of the talk

- **A semantic map of the perception/cognition domain**



Georgakopoulos, Grossman, Nikolaev, & Polis (in press), *Universal and macro-areal patterns in the lexicon. A case-study in the perception-cognition domain.* In *Linguistic Typology*, 37 pages.

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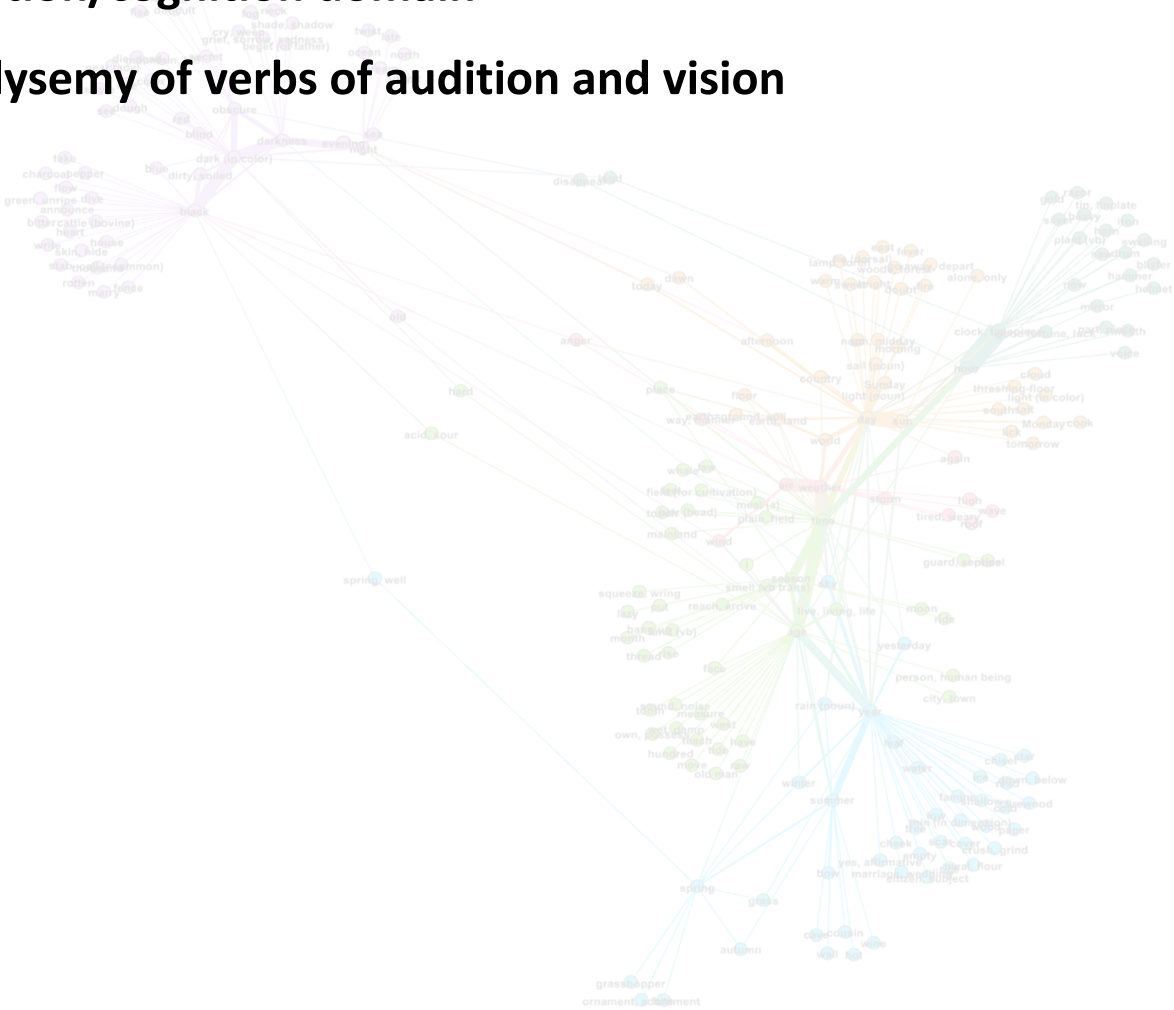
- **A semantic map of the perception/cognition domain**
- **Corpus-based study of the polysemy of verbs of audition and vision in Kirundi (Bantu language)**



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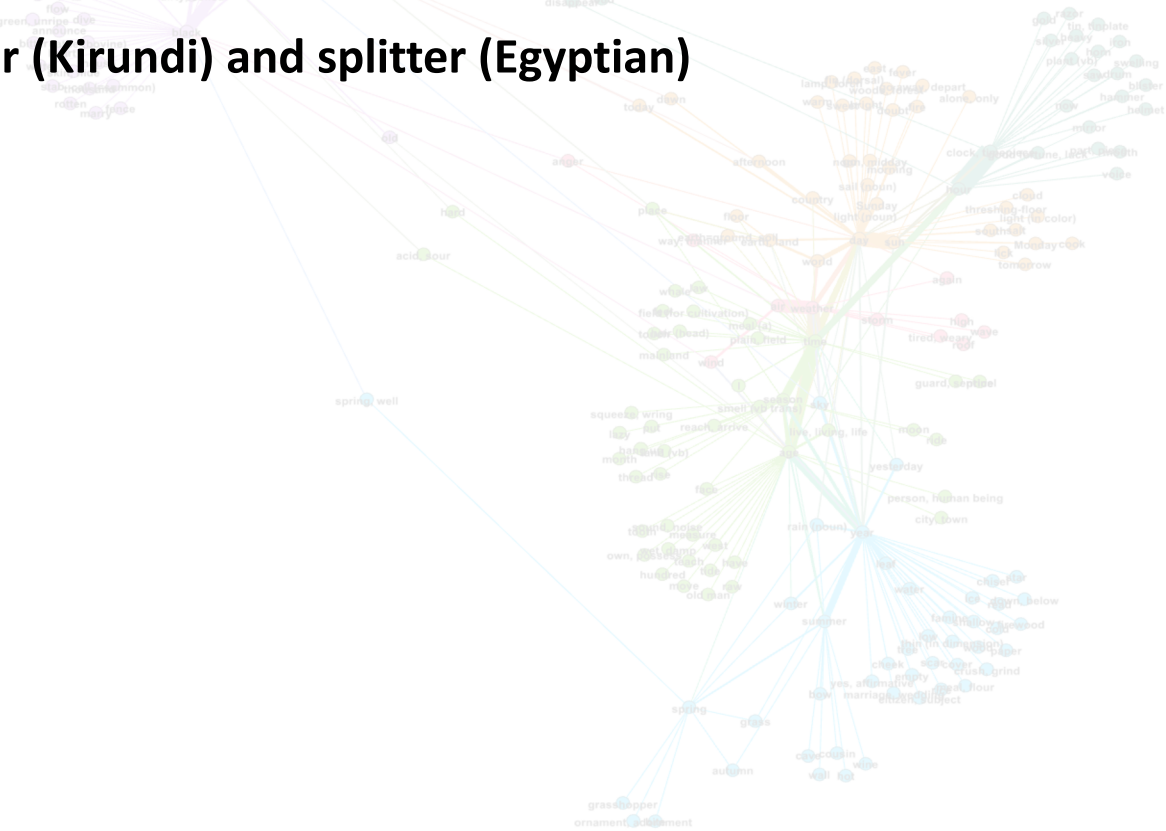
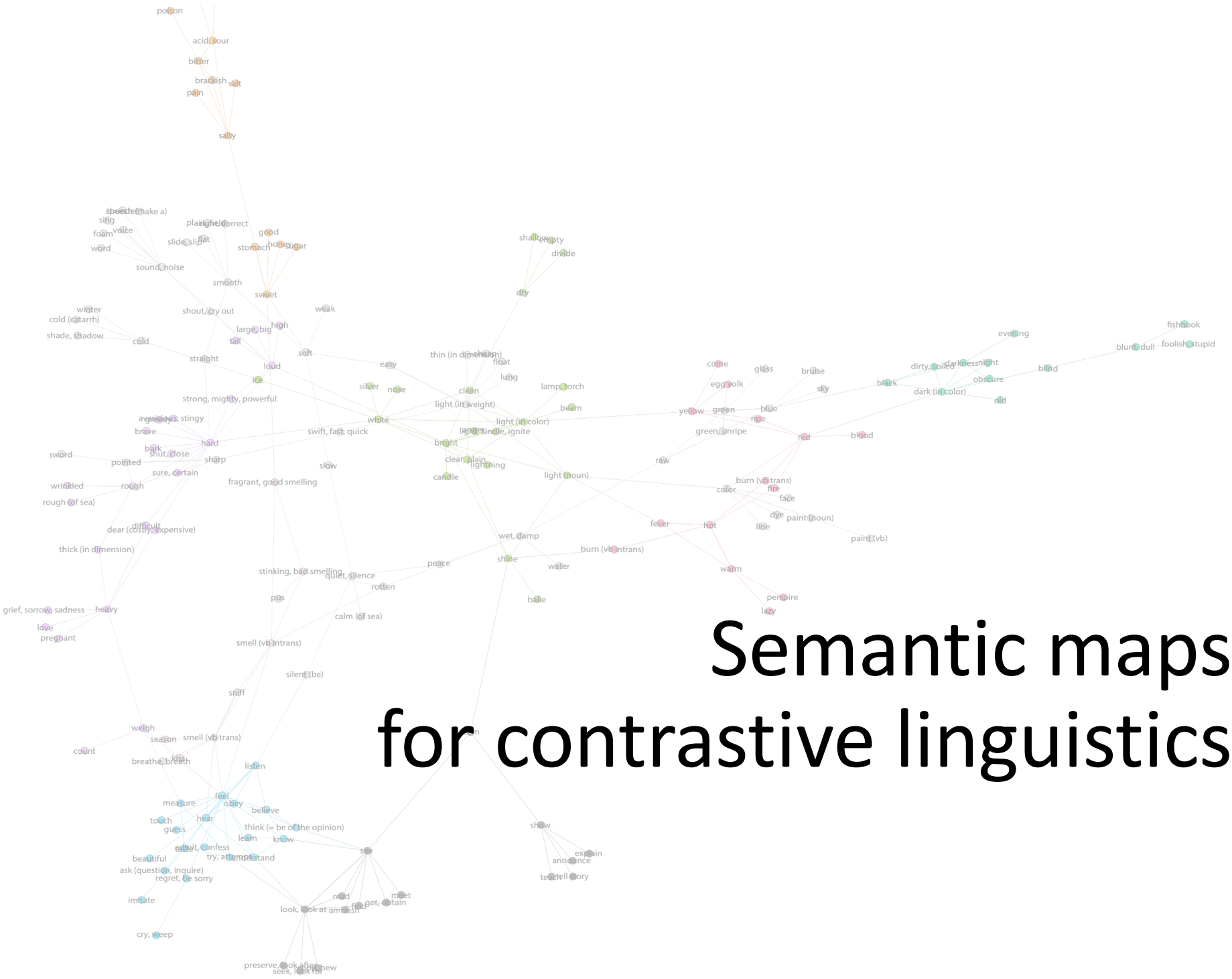
- **A semantic map of the perception/cognition domain**
- **Corpus-based study of the polysemy of verbs of audition and vision in Kirundi (Bantu language)**
- **Contrasting a polysemy lumper (Kirundi) and splitter (Egyptian) based on the map**





Semantic maps for contrastive linguistics

Semantic maps

- 'A semantic map is a geometrical representation of functions (…) that are linked by connecting lines and thus constitute a network' (Haspelmath 2003)

- A semantic map is a method for visually representing cross-linguistic regularity in semantic structure based on patterns of co-expression (Georgakopoulos & Polis 2018)

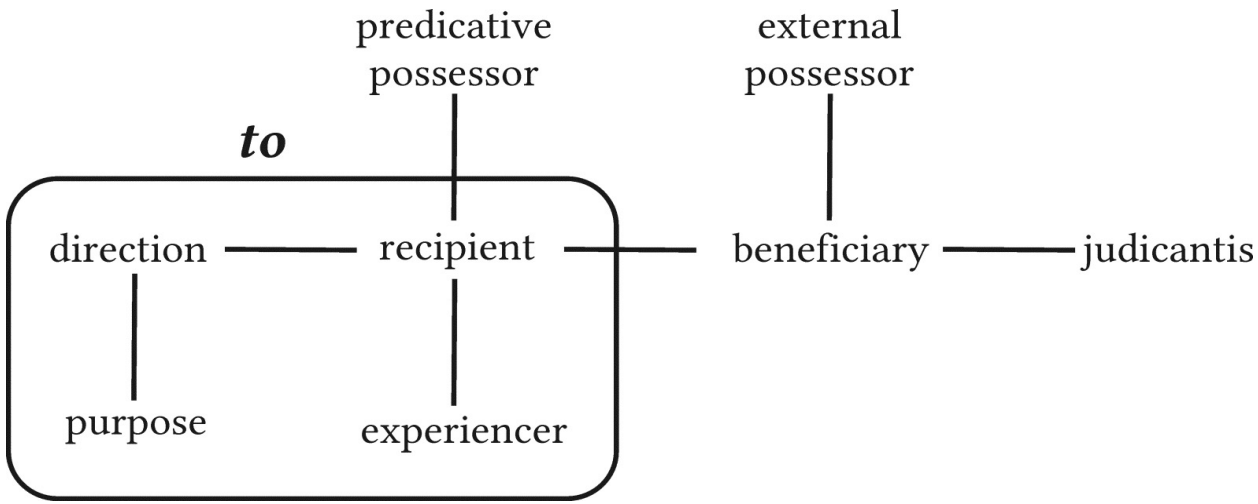


FIGURE 1. A semantic map of typical dative functions / the boundaries of English *to* (based on Haspelmath 2003: 213)

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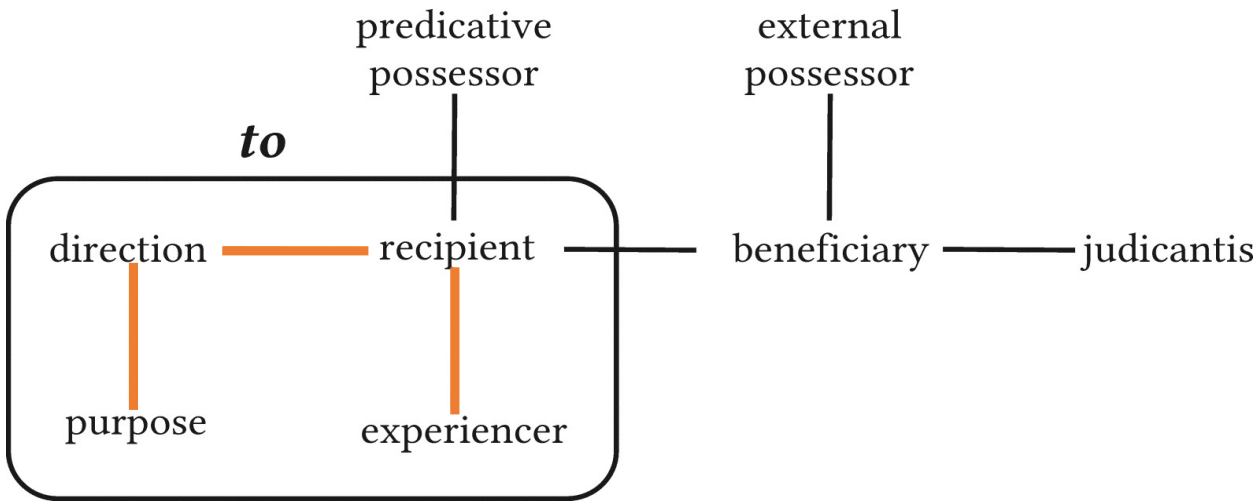

Connectivity hypothesis

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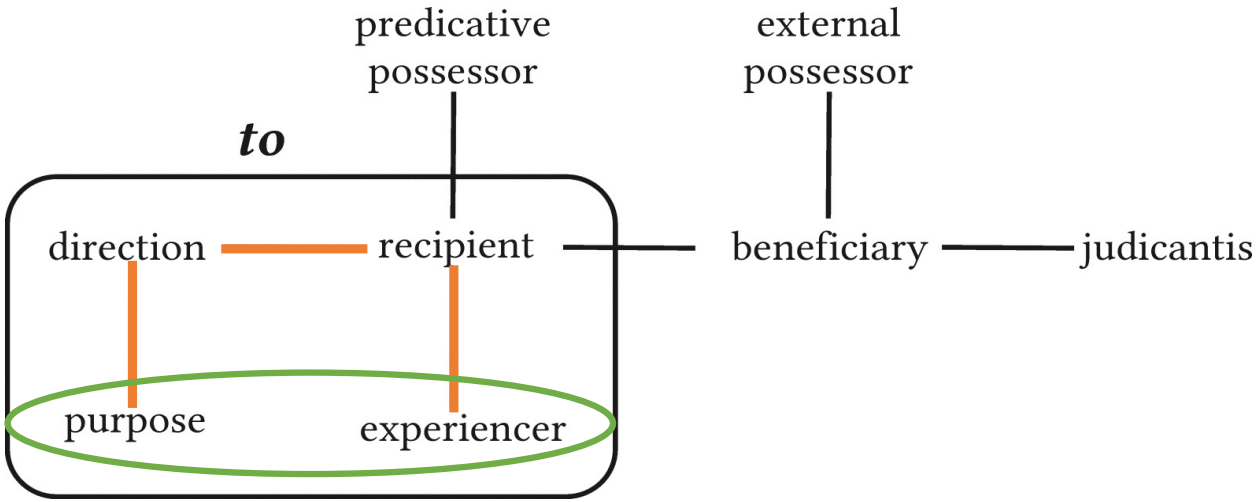

Connectivity hypothesis

Economy principle

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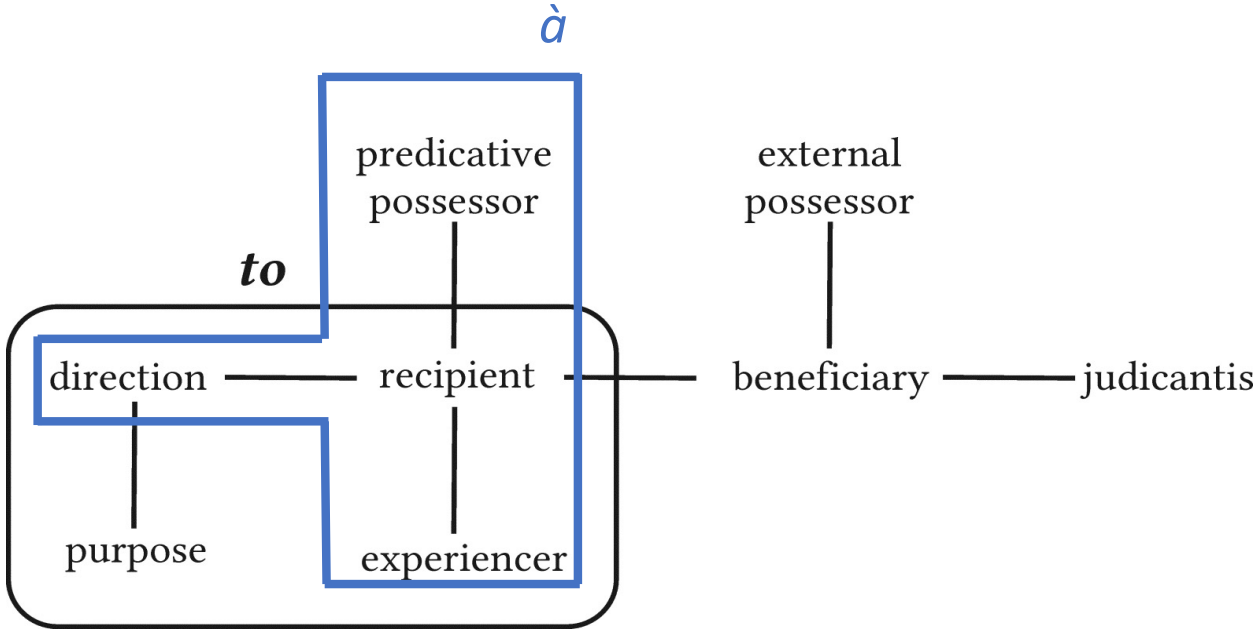

Connectivity hypothesis

Falsifiable

Economy principle

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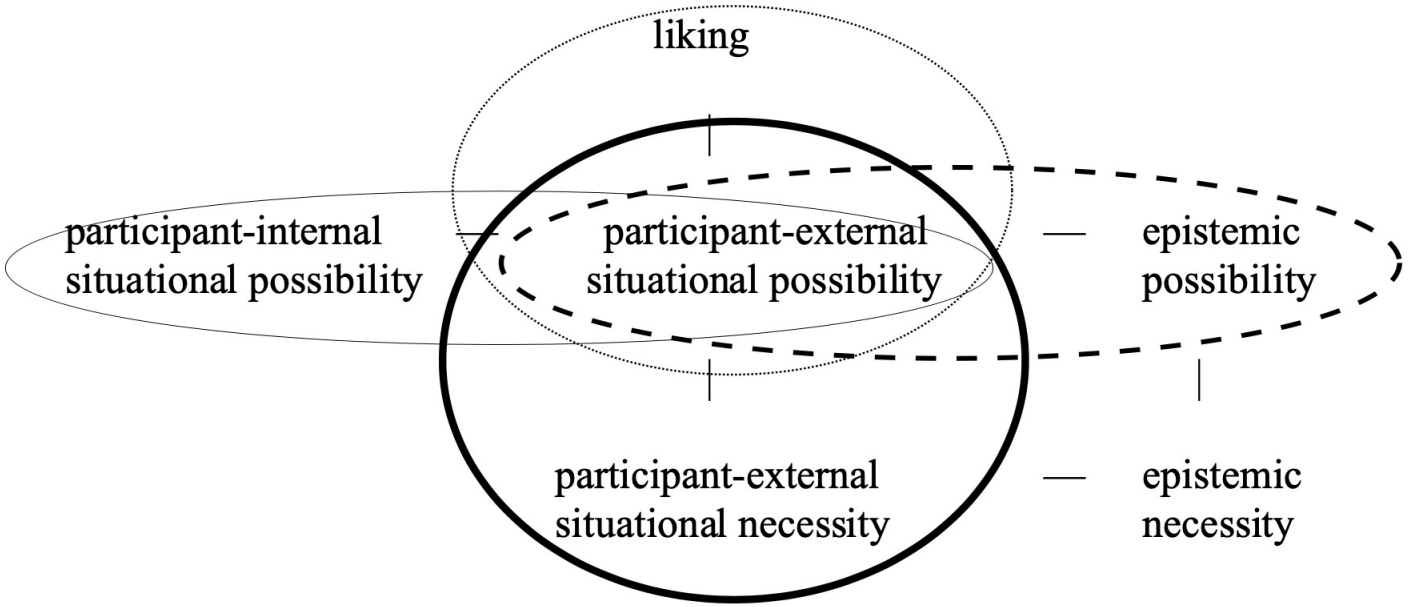
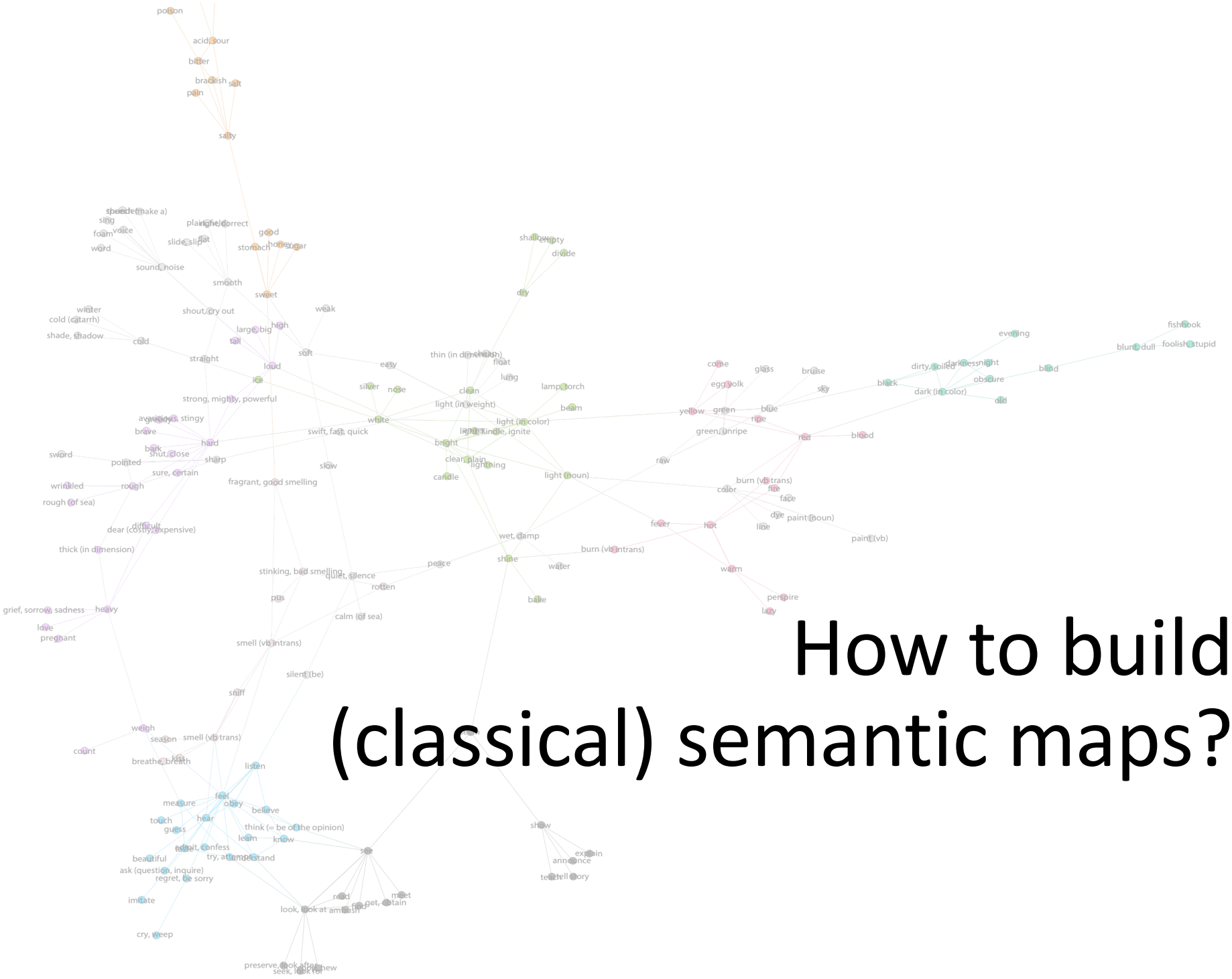
Semantic maps

(13)



Semantic maps can be used for contrastive analysis of languages
as metalanguage of comparison
(modal possibility in van der Auwera et al. (2013)



How to build (classical) semantic maps?

Semantic maps – How are they build?

Based on empirical linguistic data (patterns of co-expression)

Form	Language	SMELL (PERCEIVE)	HEAR	LISTEN	FEEL	SEE	TASTE (SOMETHING)	UNDERSTAND
thin55	Changsha	1	1	0	0	0	0	0
ak	Gurdjar	1	1	0	0	1	0	0
sentire	Italian	1	1	0	1	0	0	0
clywed	Welsh	1	1	0	0	0	0	0
nenglengay	Sanapaná	1	1	0	0	0	0	0
lingaiyi	Lengua	1	1	0	1	0	1	0
dai3n@n6	Nung-Ninbei	1	1	0	0	0	0	0
klevet	Breton	1	1	0	0	0	0	0
hnov	White Hmong	1	1	0	1	0	0	0
eta	Kali'na	1	1	0	0	0	0	1
indr	Moresada	1	1	0	0	0	0	0
theng5	Mulam	1	0	1	0	0	0	0
ka31ngiet33	Bulang	1	0	1	0	0	0	0
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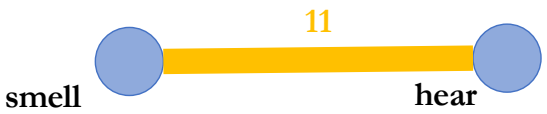

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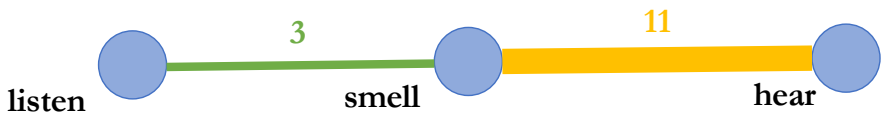

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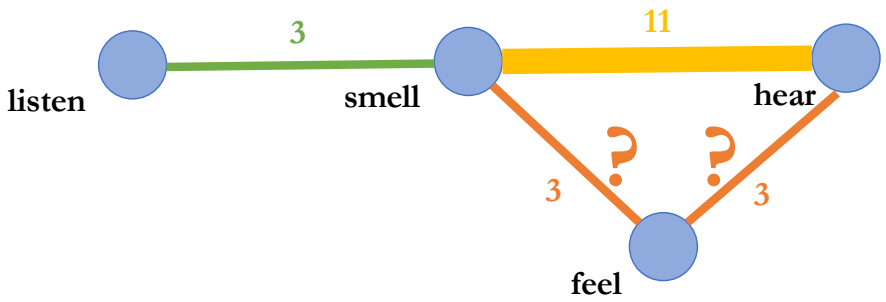

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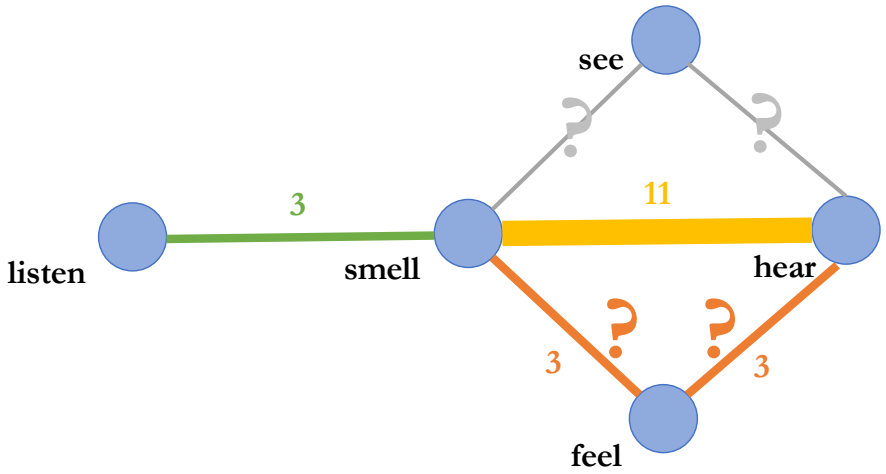

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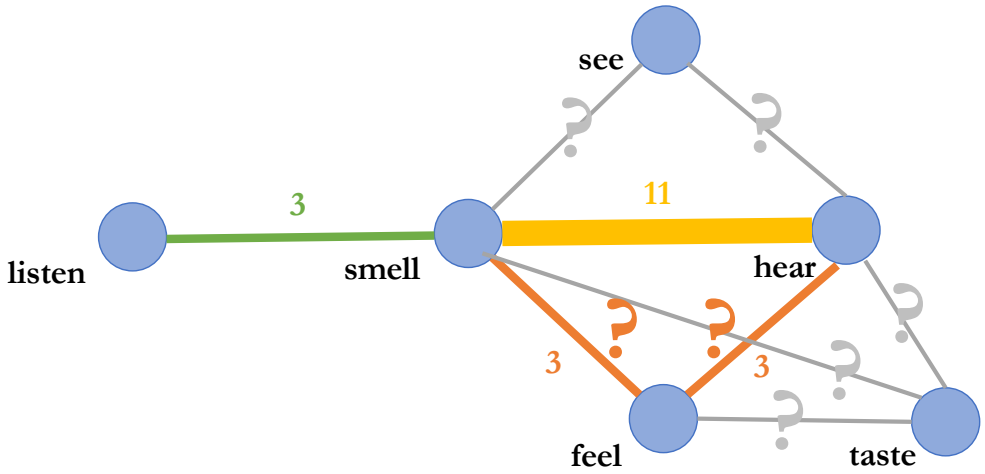
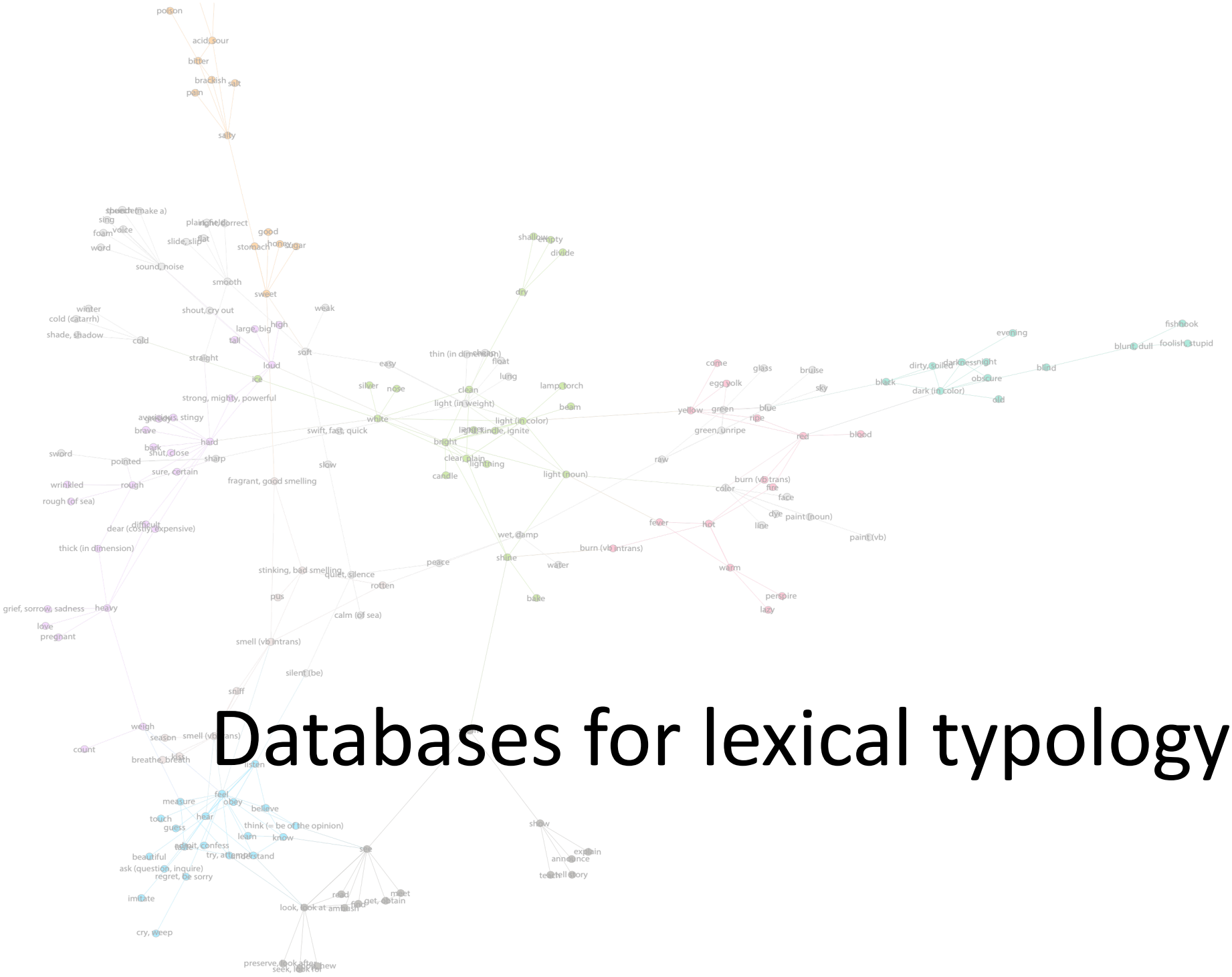


- More crosslinguistic data
  ⇒ more constraints



Databases for lexical typology

Semantic maps – How to collect data?

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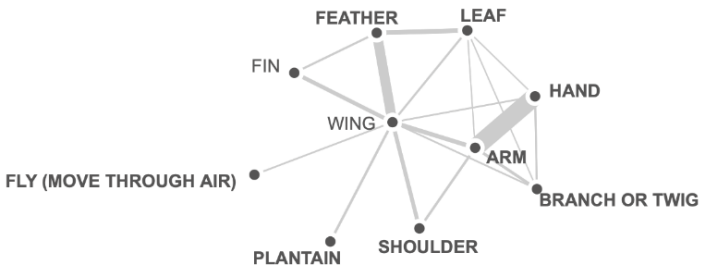
Database of Cross-Linguistic Colexifications

CLICS³ is an online database of colexifications (polysemies or homophonies) in currently 3156 language varieties of the world.

The original Database of Cross-Linguistic Colexifications (CLICS), has established a computer-assisted framework for the interactive representation of cross-linguistic colexification patterns. It has proven to be a useful tool for various kinds of investigation into cross-linguistic semantic associations, ranging from studies on semantic change, patterns of conceptualization, and linguistic paleontology. But CLICS has also been criticized for obvious shortcomings. Building on standardization efforts reflected in the CLDF initiative and novel approaches for fast, efficient, and reliable data aggregation, CLICS² expanded the original CLICS database. CLICS³ - the third installment of CLICS - exploits the framework pioneered in CLICS² to more than double the amount of data aggregated in the database.

Cite

Rzymski, Christoph and Tresoldi, Tiago et al. 2019. The Database of Cross-Linguistic Colexifications, reproducible analysis of cross-linguistic polysemies. DOI: 10.17613/5awv-6w15



2919 concepts

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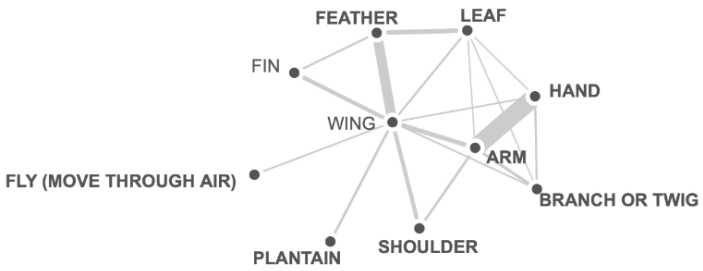

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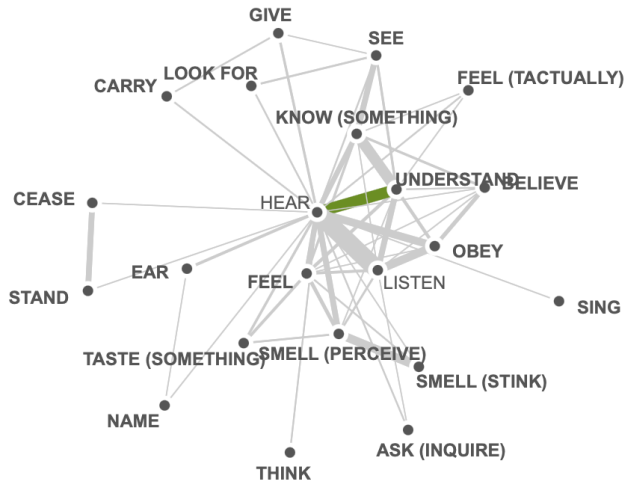
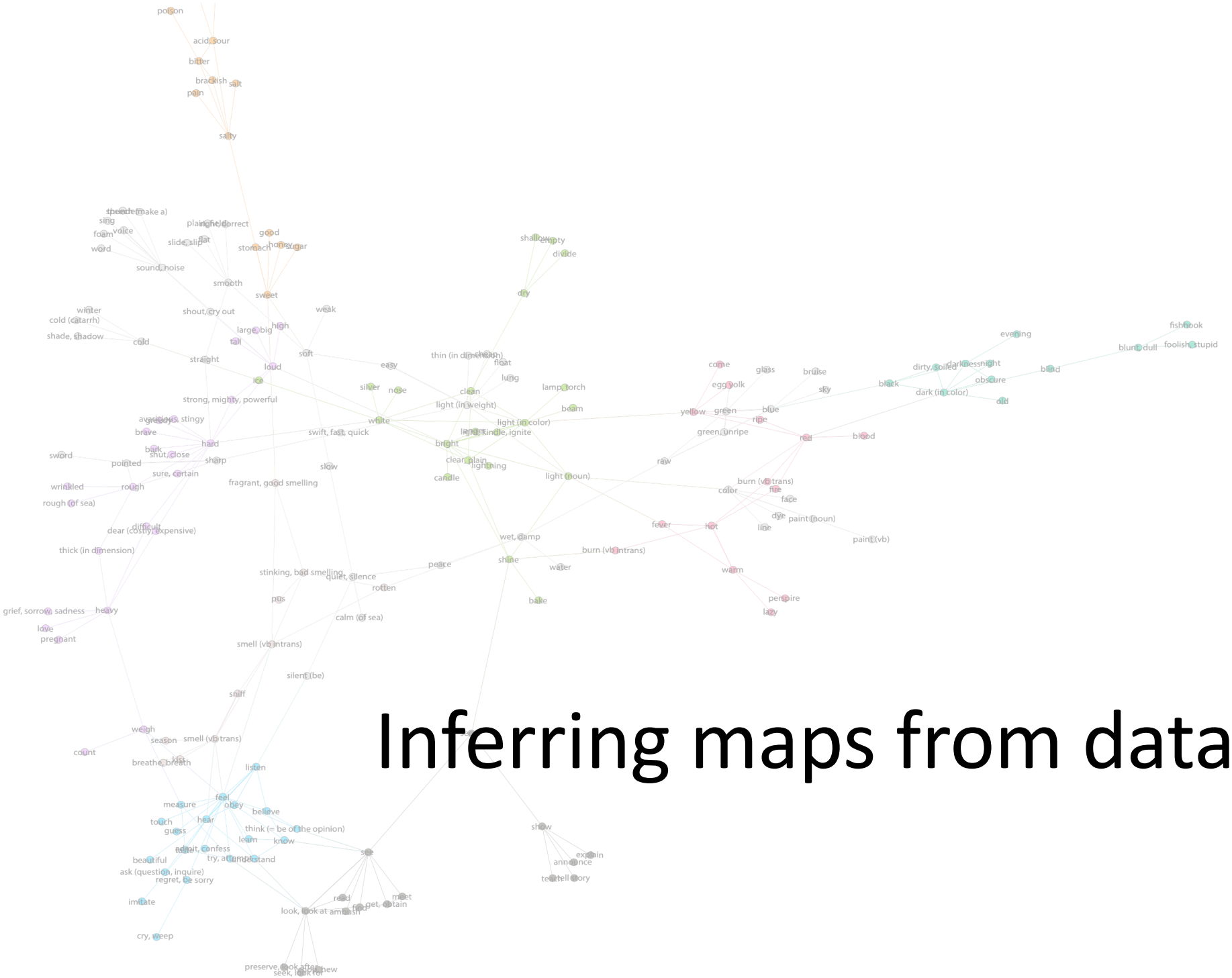
Subgraph HEAR



53 colexifications for "HEAR" and "UNDERSTAND":

Language	Family	Form
Abkhaz	Abkhaz-Adyge	ahara
Adyghe	Abkhaz-Adyge	zaxax@n
Mapudungun	Araucanian	allkun
Waurá	Arawakan	eteme
Proto Polynesian	Austronesian	ppnrongo
Takia	Austronesian	long
Colorado	Barbacoan	merano
Basque	Basque	aditu
Burushaski	Burushaski	djel
Kali'na	Cariban	eta



Inferring maps from data

Inferring semantic maps

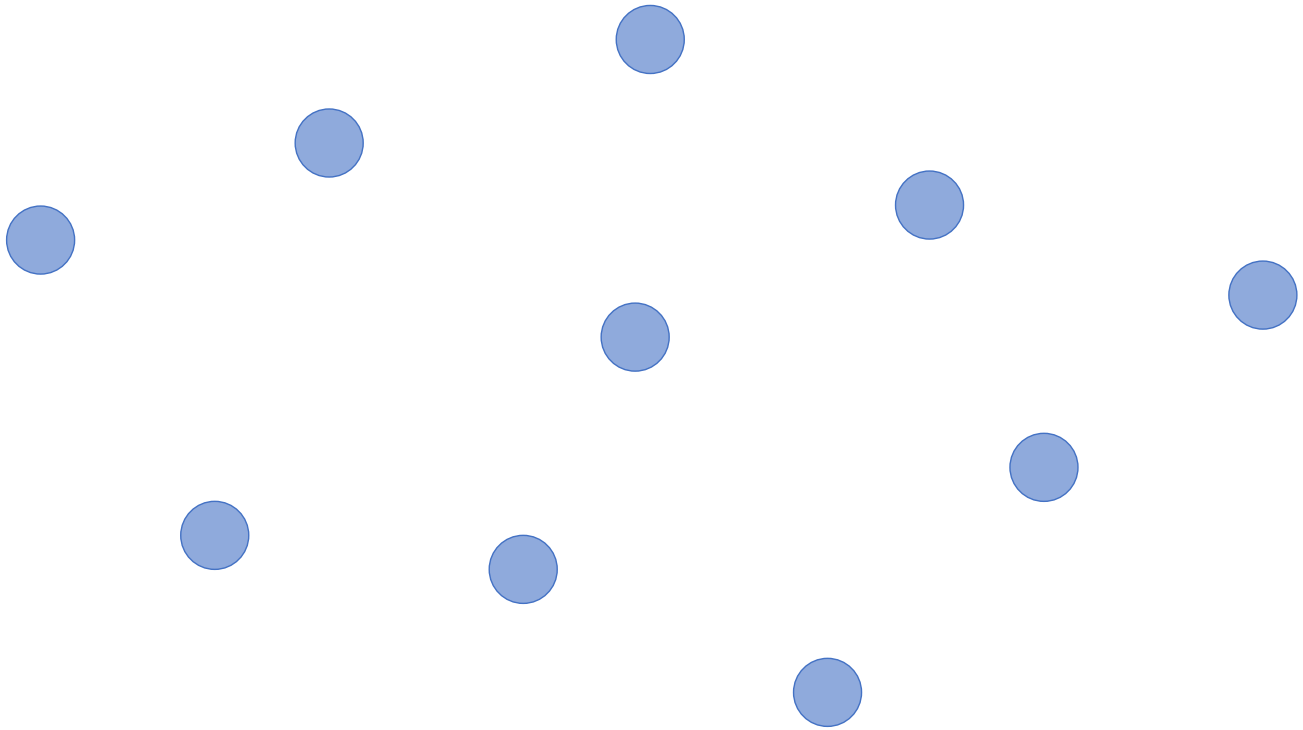
"ideally (…) it should be possible to generate semantic maps automatically on the basis of a given set of data"
(Narrog & Ito 2007: 280)

Inferring semantic maps

Regier, Khetarpal, and Majid showed that the semantic map inference problem is “formally identical to another problem that superficially appears unrelated: inferring a social network from outbreaks of disease in a population” (Regier *et al.* 2013: 91)

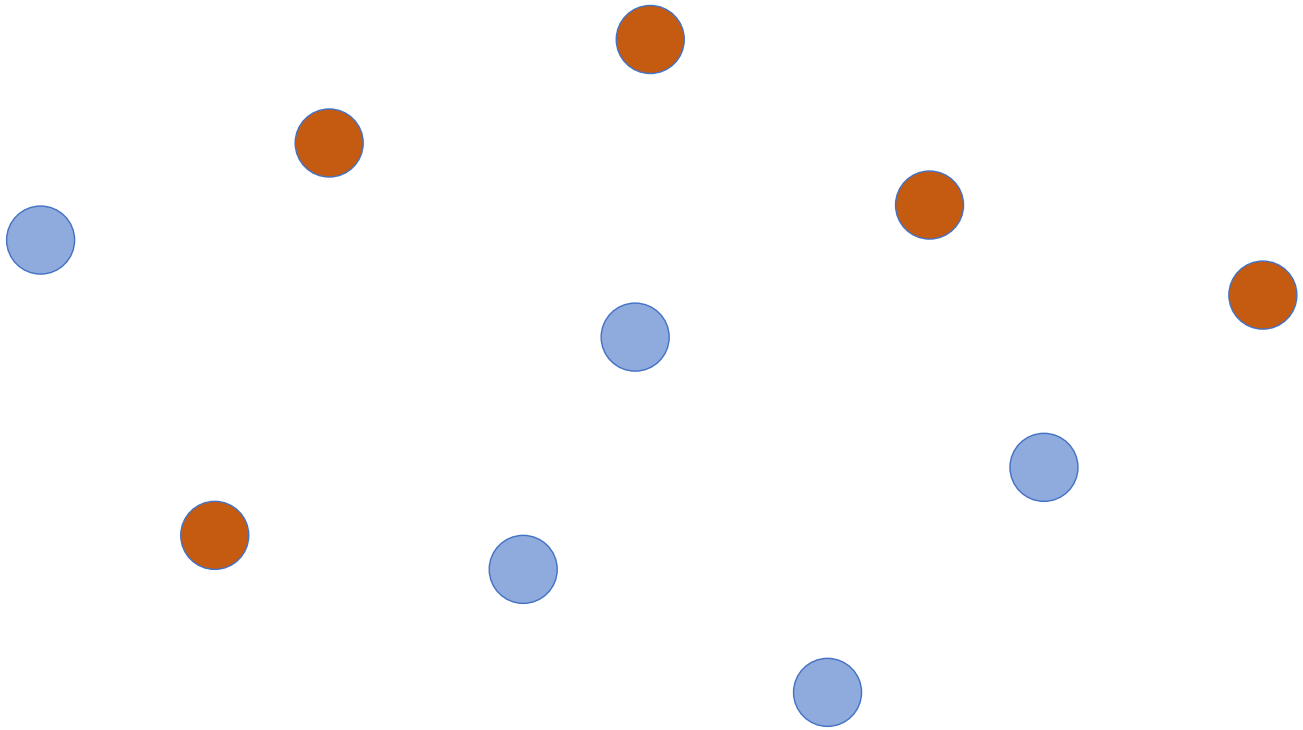
Inferring semantic maps

- What's the idea?
  - Consider a group of social agents (represented by the nodes of a potential graph)



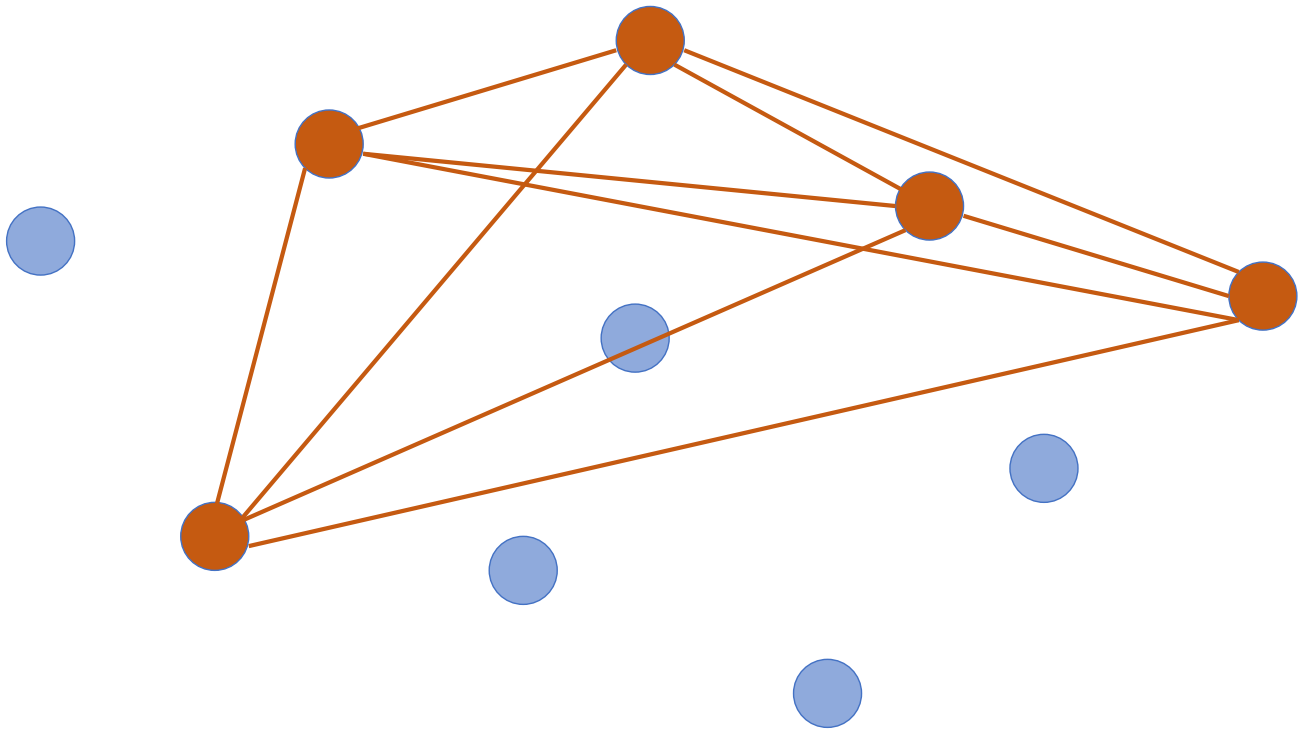
Inferring semantic maps

- What's the idea?
  - If one observes the same disease (say Covid-19) for five of these agents (technically called a constraint on the nodes of the graph)



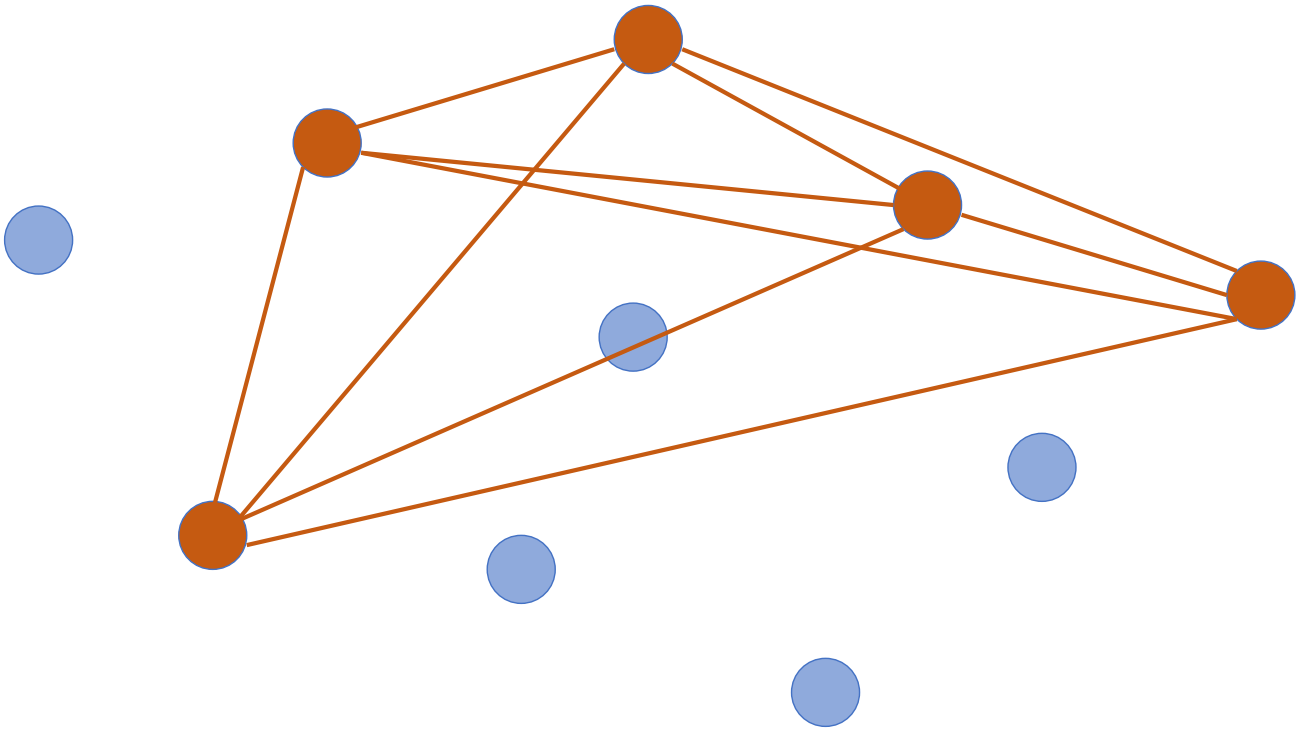
Inferring semantic maps

- What's the idea?
  - One can postulate that all the agents met, so that all the nodes of the graph are connected (10 edges between the 5 nodes)



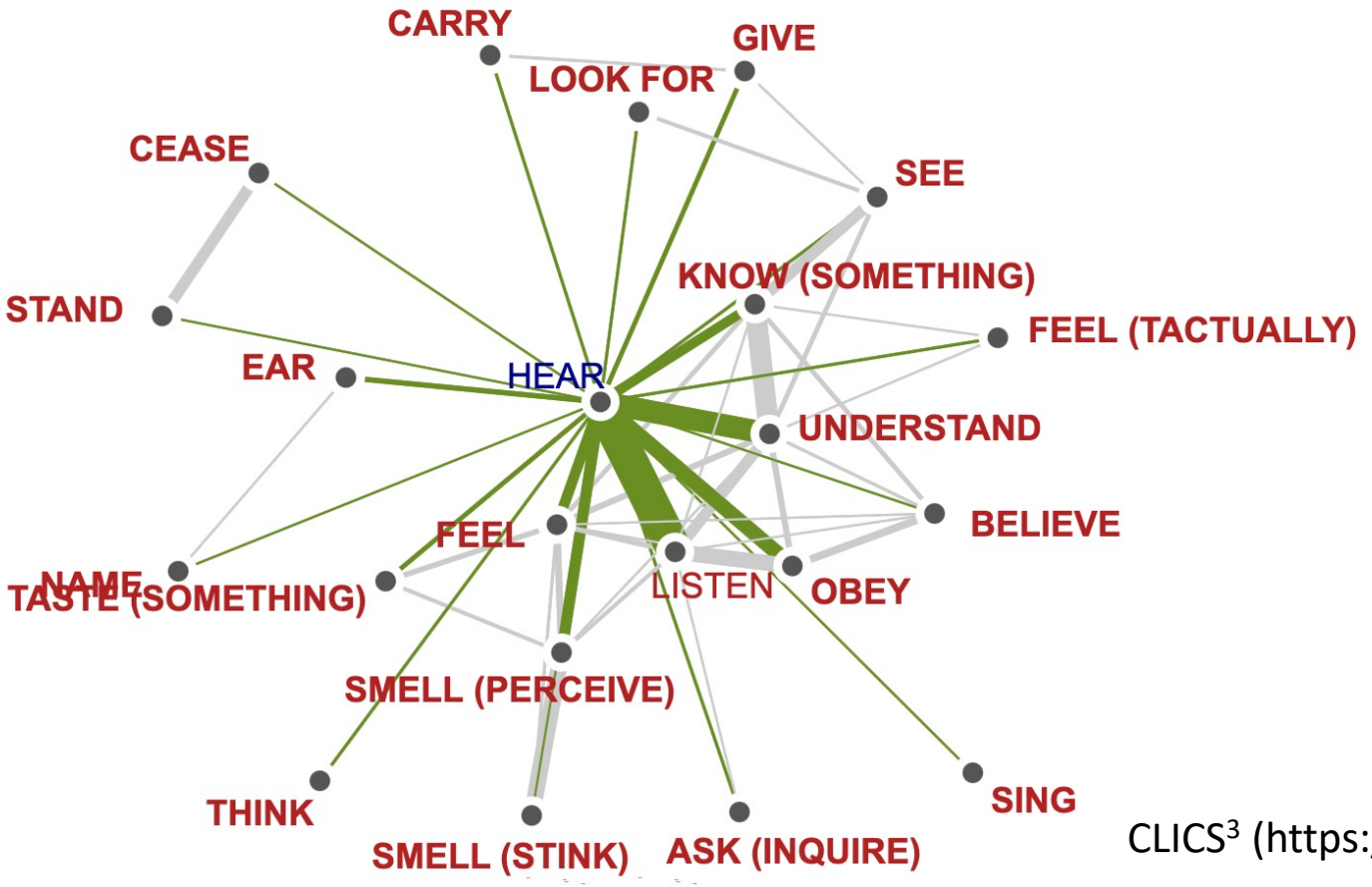
Inferring semantic maps

- What's the idea?
  - This is neither a very likely, nor a very economic explanation



Inferring semantic maps

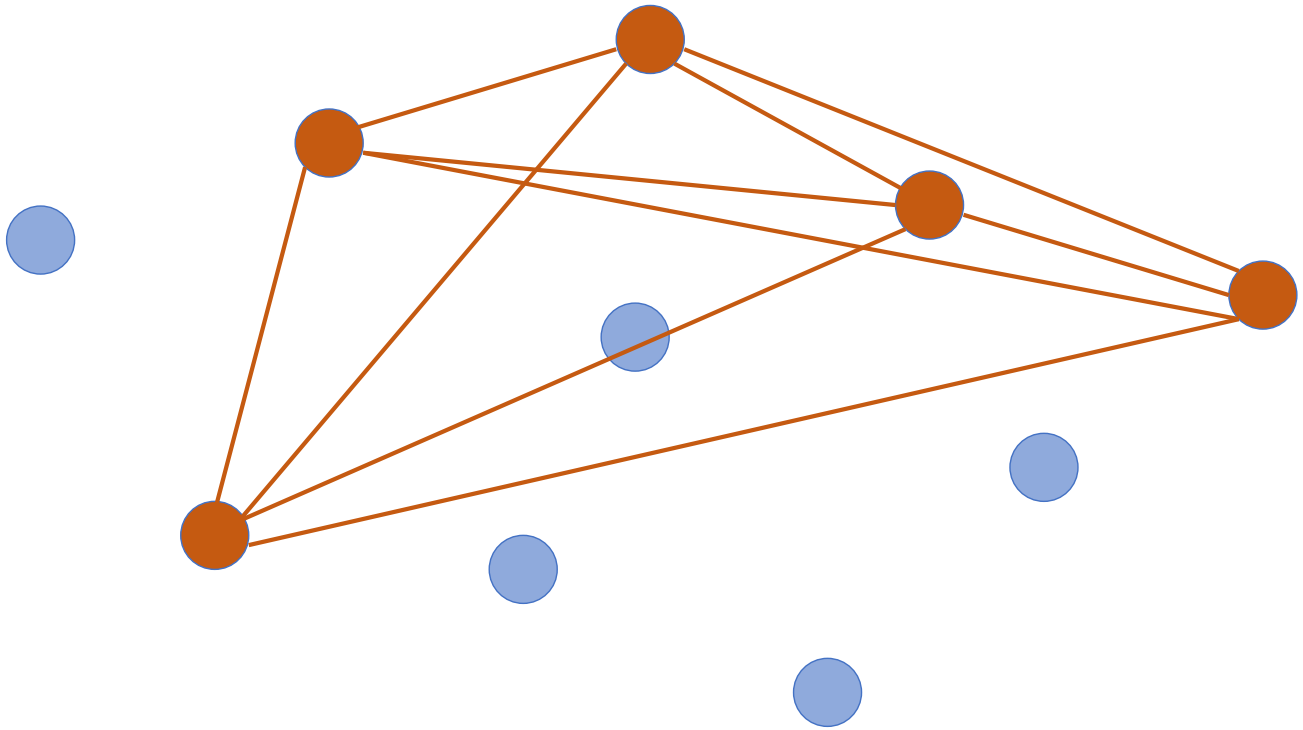
- What's the idea?
  - But this is precisely what a colexification network does



CLICS[3] (https://clics.clld.org)

Inferring semantic maps

- What's the idea?
  - The goal would be to find a more economical solution and to have all the social agents connected with as few edges as possible, but still accounting for all the observations



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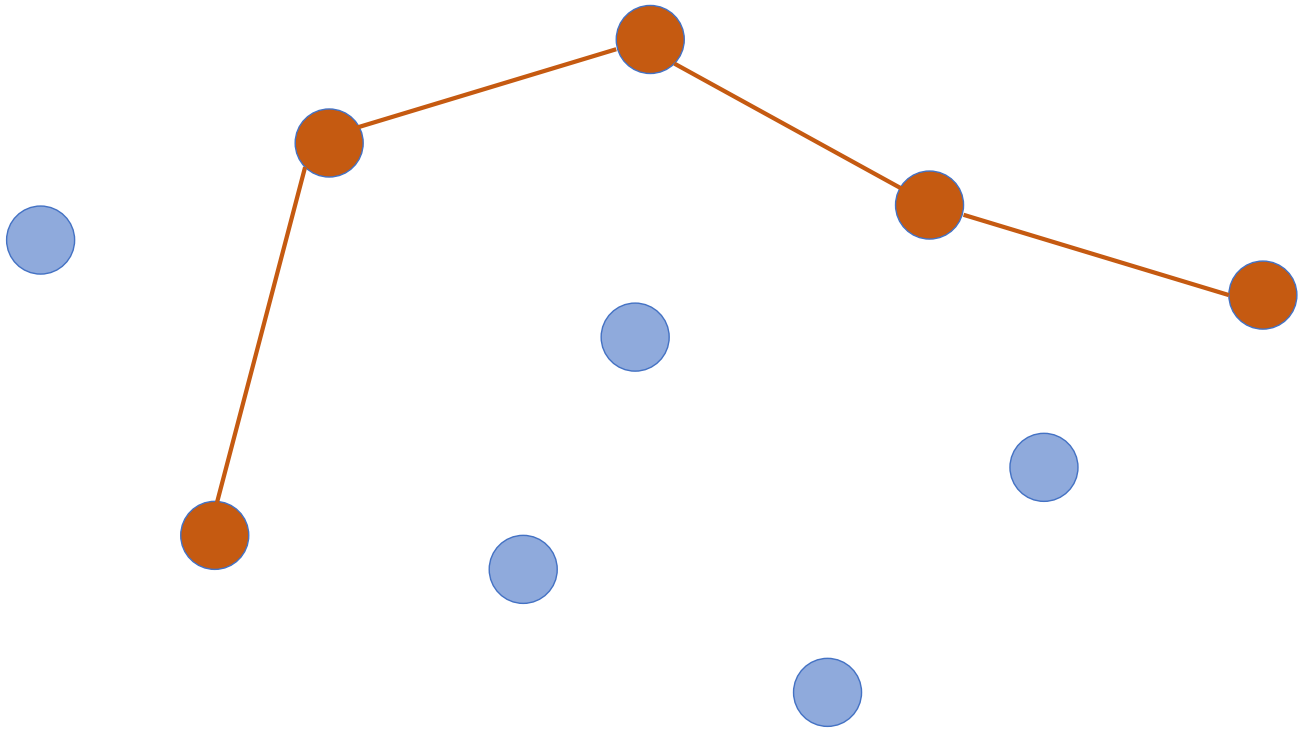
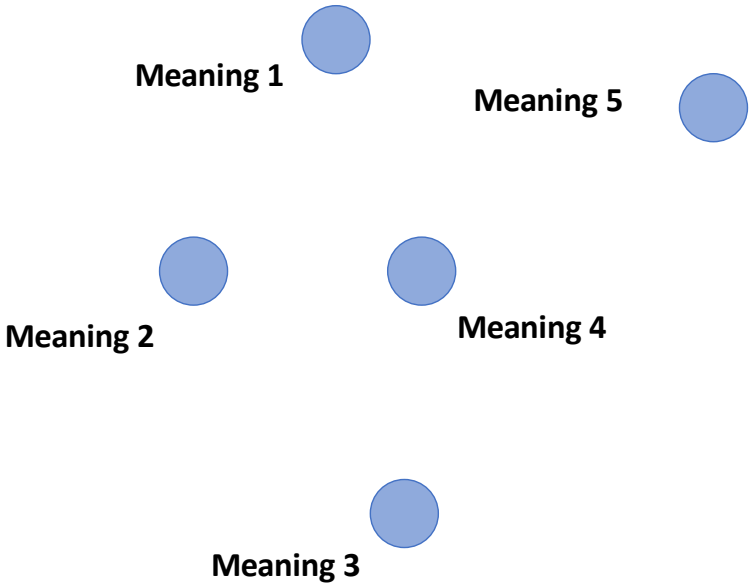


Inferring semantic maps

- How does it transfer to semantic maps?

Inferring semantic maps

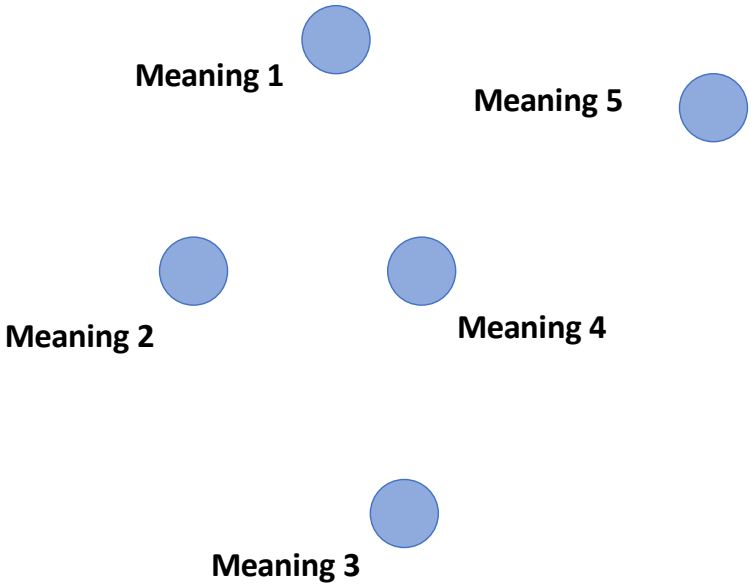
- How does it transfer to semantic maps?
  - Nodes are meanings



Meaning	1	2	3	4	5

Inferring semantic maps

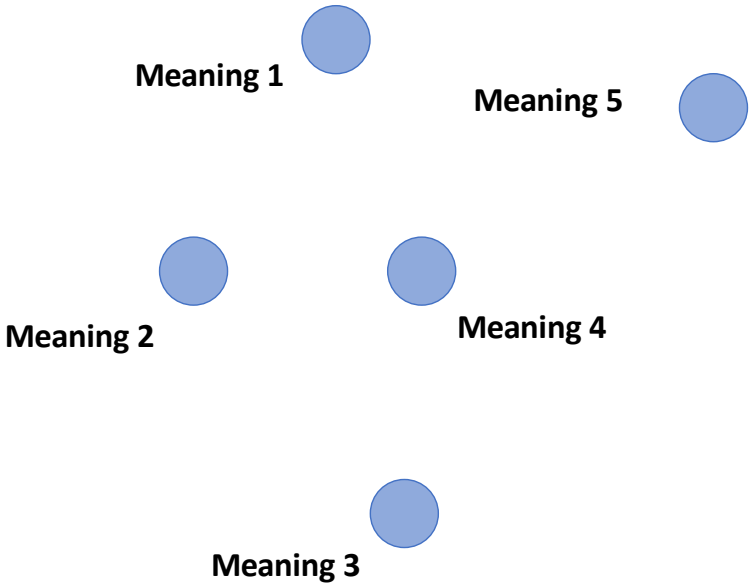
- How does it transfer to semantic maps?
  - Nodes are meanings
  - Constraints are patterns of co-expression (connectivity hypothesis)



Meaning	1	2	3	4	5
Polysemic item A	√	√			
Polysemic item B		√	√	√	
Polysemic item C			√	√	√

Inferring semantic maps

- How does it transfer to semantic maps?
  - Nodes are meanings
  - Constraints are patterns of co-expression (connectivity hypothesis)
  - One connects the nodes economically based on these constraints (economy principle)



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Inferring semantic maps

- How does it transfer to semantic maps?
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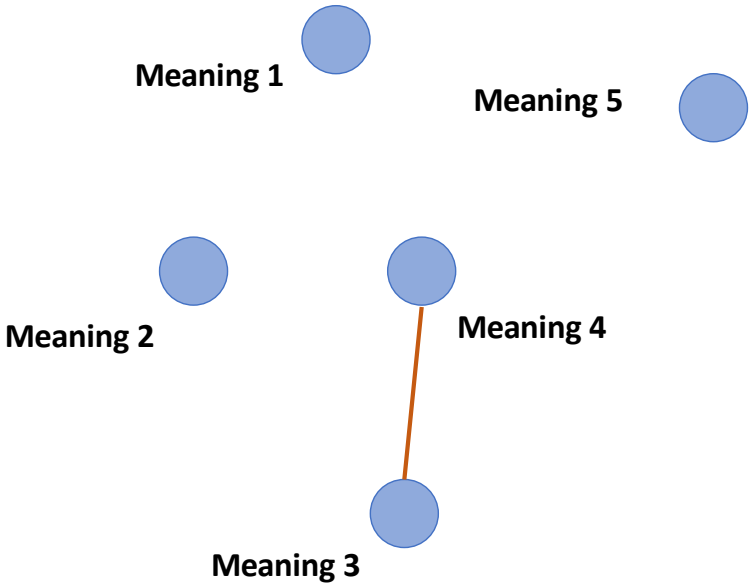
  - One connects the nodes economically based on these constraints, starting with the edge(s) that accounts for the most frequent constraint(s)



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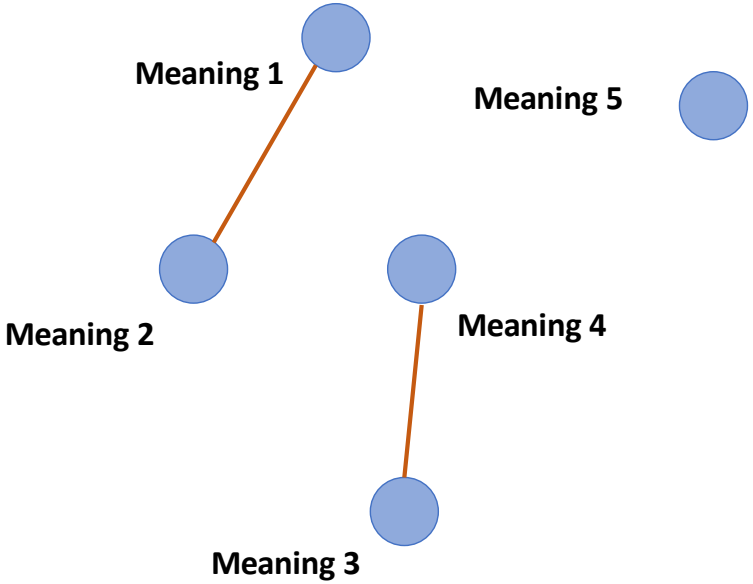

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Polysemic item B		√	√	√	
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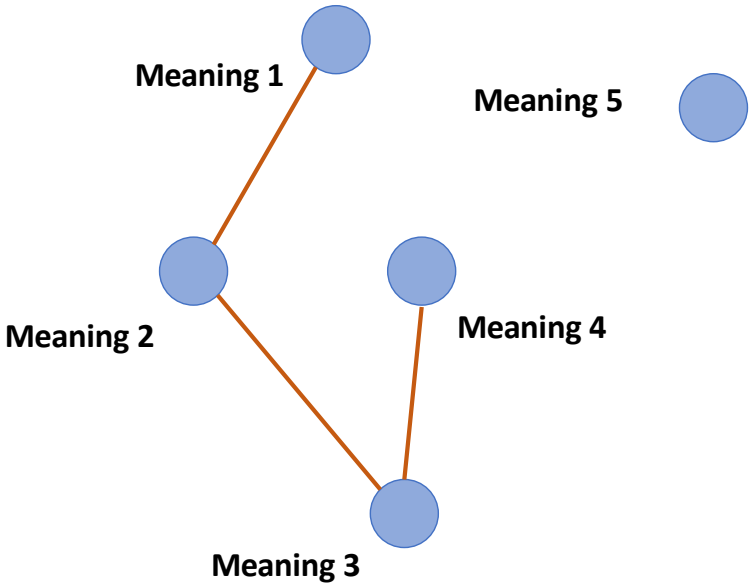

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Polysemic item A	√	√			
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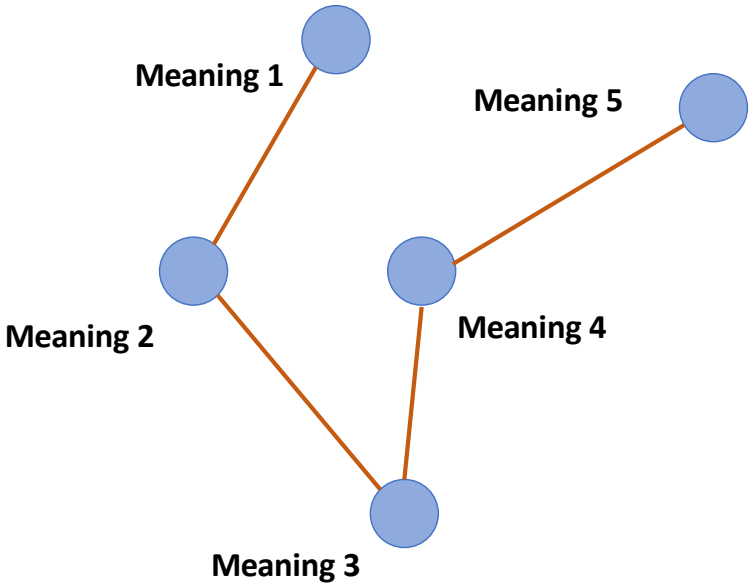

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Polysemic item A	√	√			
Polysemic item B		√	√	√	
Polysemic item C			√	√	√

Inferring semantic maps

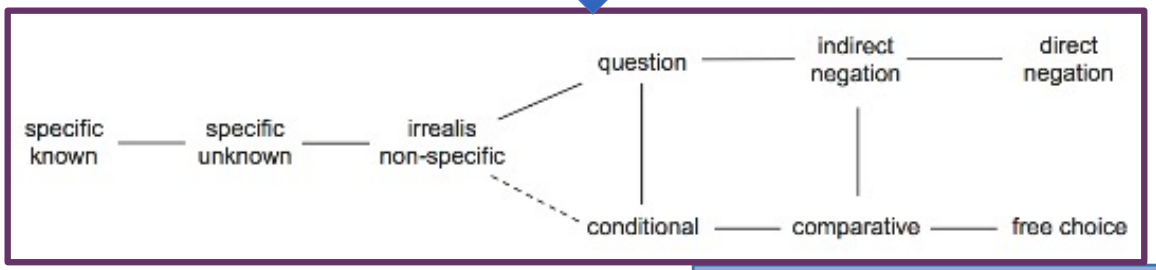
INPUT
(lexical matrix)

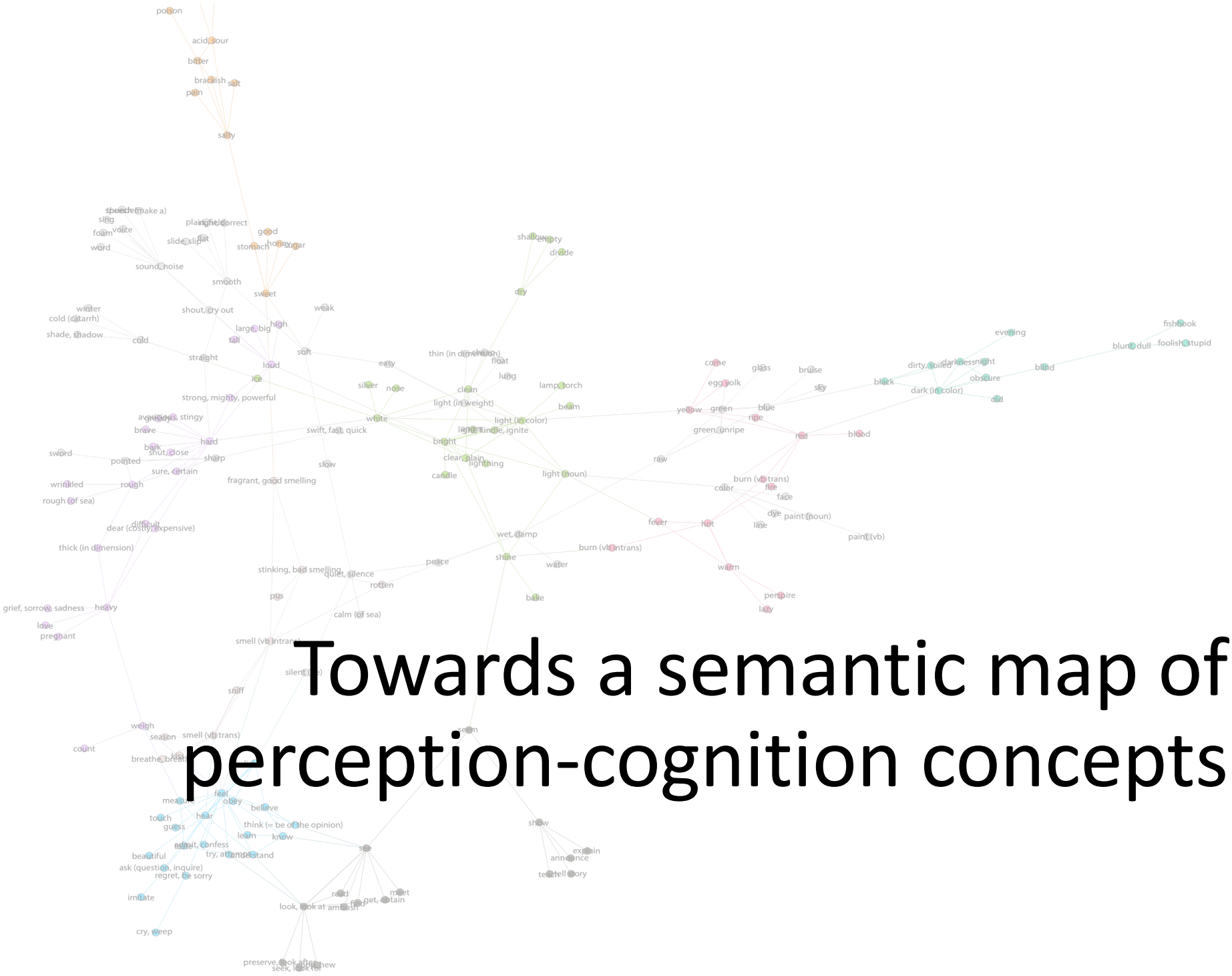
Language	*Word*	Specific Known	Specific Unknown	Irrealis Non-specific	Question	Conditional	Indirect Negation
		SK	**SU**	**IR**	**QN**	**CD**	**IN**
German	"etwas"	1	1	1	1	1	1
German	"irgend"	0	1	1	1	1	1
German	"je"	0	0	0	1	1	1
German	"jeder"	0	0	0	0	0	1
German	"n-"	0	0	0	0	0	0
Dutch	"dan ook"	0	0	1	1	1	1
Dutch	"enig"	0	0	0	1	1	1
Dutch	"iets"	1	1	1	1	1	1
Dutch	"niets"	0	0	0	0	0	0
English	"any"	0	0	0	1	1	1
English	"ever"	0	0	0	1	1	1
English	"no"	0	0	0	0	0	0
English	"some"	1	1	1	1	1	0

ALGORITHM
(python script)

```
# MAIN LOOP
objfn = C(G,T)
while (objfn < 0):
    print ("objective fn is currently", objfn,)
    max_score = 0
    # choose next edge greedily: the one that increases objfn the most
    for e in PossE:
        # temporarily add e to graph G
        G.add_edge(*e)
        score = C(G,T) - objfn
        G.remove_edge(*e)
        if (score > max_score):
            max_score = score
            max_edge = e
```

RESULT
(semantic map)

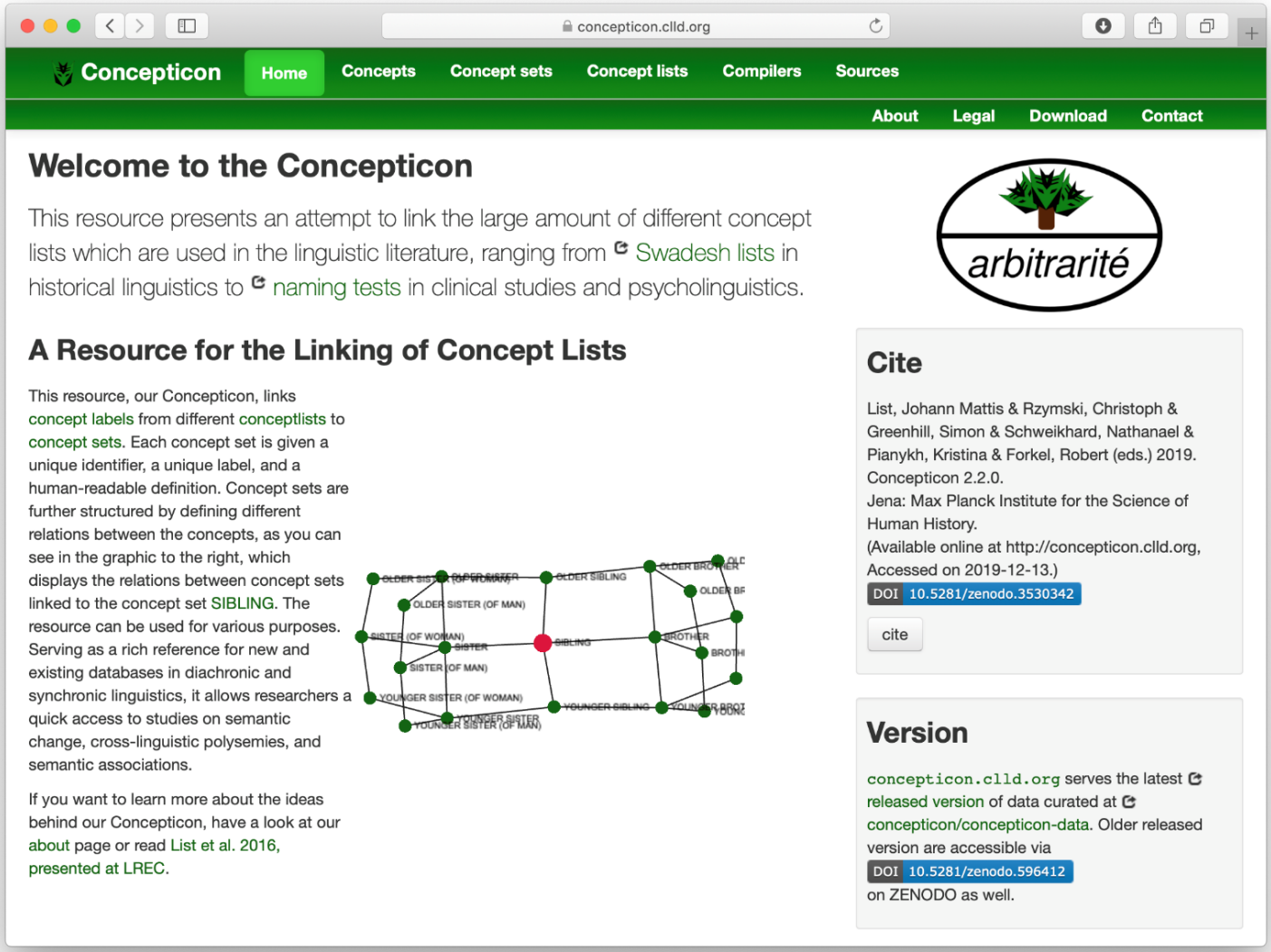




Towards a semantic map of perception-cognition concepts

Towards a semantic map of perception/cognition concepts

Which concepts?



Towards a semantic map of perception/cognition concepts

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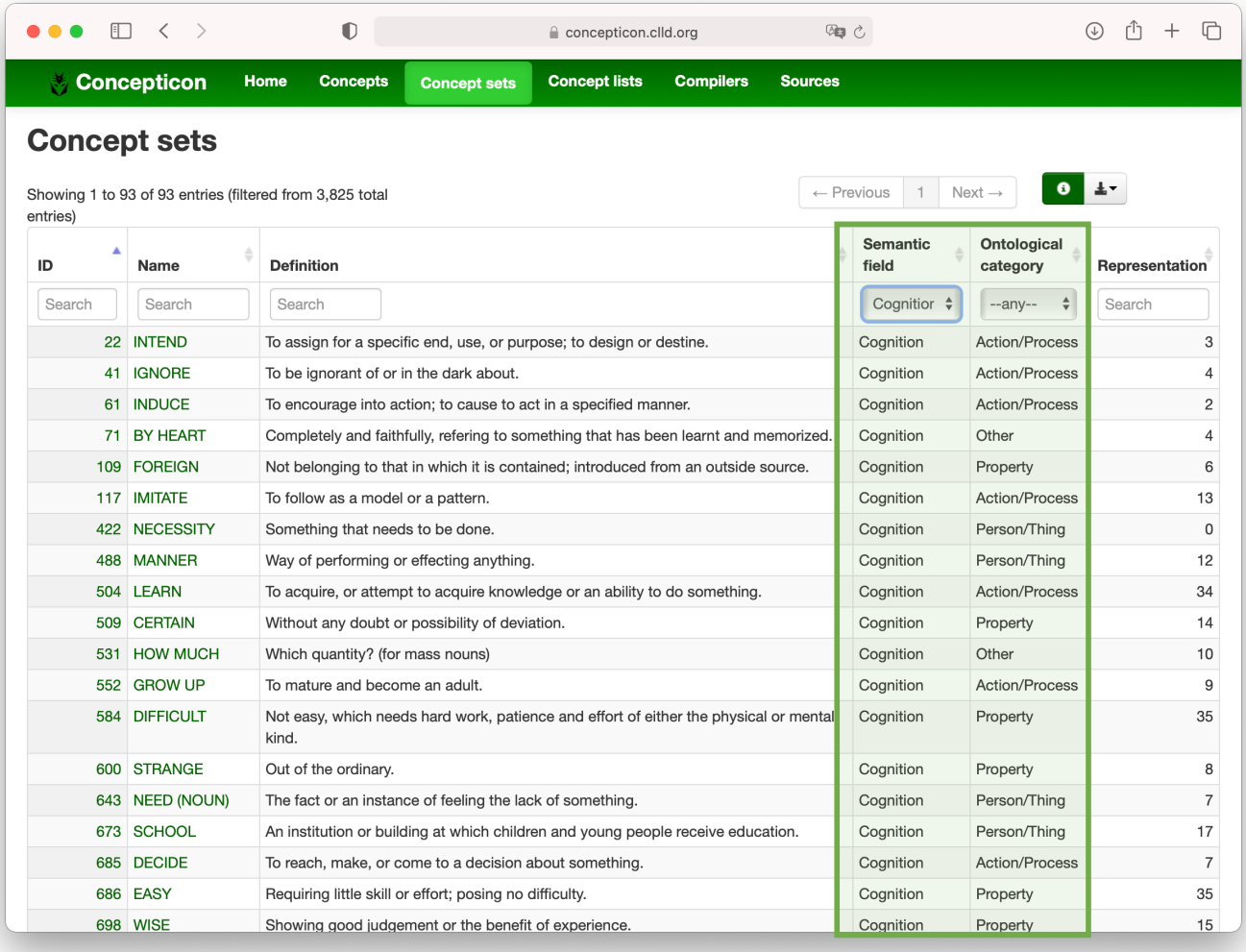


ID	Name	Definition	Semantic field	Ontological category	Representation
Search	Search	Search	Cognitior	--any--	Search
22	INTEND	To assign for a specific end, use, or purpose; to design or destine.	Cognition	Action/Process	3
41	IGNORE	To be ignorant of or in the dark about.	Cognition	Action/Process	4
61	INDUCE	To encourage into action; to cause to act in a specified manner.	Cognition	Action/Process	2
71	BY HEART	Completely and faithfully, refering to something that has been learnt and memorized.	Cognition	Other	4
109	FOREIGN	Not belonging to that in which it is contained; introduced from an outside source.	Cognition	Property	6
117	IMITATE	To follow as a model or a pattern.	Cognition	Action/Process	13
422	NECESSITY	Something that needs to be done.	Cognition	Person/Thing	0
488	MANNER	Way of performing or effecting anything.	Cognition	Person/Thing	12
504	LEARN	To acquire, or attempt to acquire knowledge or an ability to do something.	Cognition	Action/Process	34
509	CERTAIN	Without any doubt or possibility of deviation.	Cognition	Property	14
531	HOW MUCH	Which quantity? (for mass nouns)	Cognition	Other	10
552	GROW UP	To mature and become an adult.	Cognition	Action/Process	9
584	DIFFICULT	Not easy, which needs hard work, patience and effort of either the physical or mental kind.	Cognition	Property	35
600	STRANGE	Out of the ordinary.	Cognition	Property	8
643	NEED (NOUN)	The fact or an instance of feeling the lack of something.	Cognition	Person/Thing	7
673	SCHOOL	An institution or building at which children and young people receive education.	Cognition	Person/Thing	17
685	DECIDE	To reach, make, or come to a decision about something.	Cognition	Action/Process	7
686	EASY	Requiring little skill or effort; posing no difficulty.	Cognition	Property	35
698	WISE	Showing good judgement or the benefit of experience.	Cognition	Property	15

Towards a semantic map of perception/cognition concepts

Which concepts?

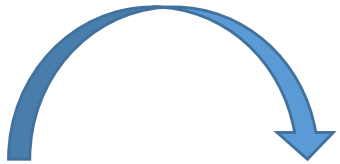
Concepticon

BE IGNORANT	HURT (SENSE PAIN)	SENSE (PERCEIVE BY
BECOME NUMB	HURT (SOMEBODY)	SENSES)
BELIEVE	IGNORE	SHINE
BETRAY	IMITATE	SHOW
CHECK	INDUCE	SMELL
DECEIVE	INTEND	SMELL (PERCEIVE)
DECIDE	INVESTIGATE	SMELL (STINK)
DO NOT DO IT	KNOW	SNIFF
DOUBT (SOMETHING)	KNOW (SOMEBODY)	STUDY
ERR	KNOW (SOMETHING)	SUCCEED
EXPLAIN	KNOW OR BE ABLE	SUSPECT
FEEL	LEARN	TASTE (SOMETHING)
FIND	LISTEN	TEACH
FIND OUT	LOOK	THINK
FORGET	LOOK FOR	THINK (BELIEVE)
FRIGHTEN	PINCH	THINK (REFLECT)
GET WET	PRETEND	TOUCH
GROW UP	REMEMBER	TRY
GUESS	RESULT IN	UNDERSTAND
HEAR	SEE	
HESITATE	SEEM	

60

Towards a semantic map of perception/cognition concepts

Which concepts?



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GROW UP	REMEMBER	TRY
GUESS	RESULT IN	UNDERSTAND
HEAR	SEE	
HESITATE	SEEM	

60

CLICS 3

BELIEVE	LISTEN	STUDY
BETRAY	LOOK	SUCCEED
DECEIVE	LOOK FOR	SUSPECT
EXPLAIN	PINCH	TASTE (SOMETHING)
FEEL	REMEMBER	TEACH
FIND	RESULT IN	THINK
FORGET	SEE	THINK (BELIEVE)
GUESS	SEEM	THINK (REFLECT)
HEAR	SHINE	TOUCH
IMITATE	SHOW	TRY
KNOW (SOMETHING)	SMELL (PERCEIVE)	UNDERSTAND
KNOW OR BE ABLE	SMELL (STINK)	
LEARN	SNIFF	

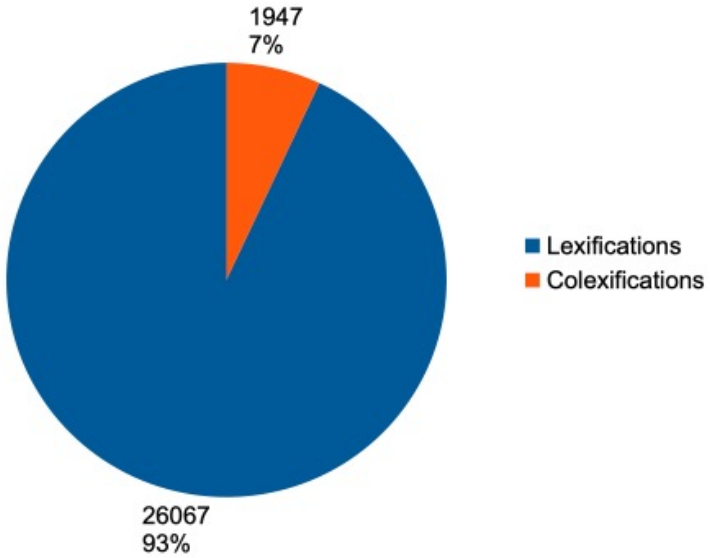
37

Towards a semantic map of perception/cognition concepts

Emotions (properties) in CLICS^2 (colexifications in 1220 languages)

BELIEVE	SEEM
BETRAY	SHINE
DECEIVE	SHOW
EXPLAIN	SMELL (PERCEIVE)
FEEL	SMELL (STINK)
FIND	SNIFF
FORGET	STUDY
GUESS	SUCCEED
HEAR	SUSPECT
IMITATE	TASTE (SOMETHING)
KNOW (SOMETHING)	TEACH
KNOW OR BE ABLE	THINK
LEARN	THINK (BELIEVE)
LISTEN	THINK (REFLECT)
LOOK	TOUCH
LOOK FOR	TRY
PINCH	UNDERSTAND
REMEMBER	
RESULT IN	
SEE	

37



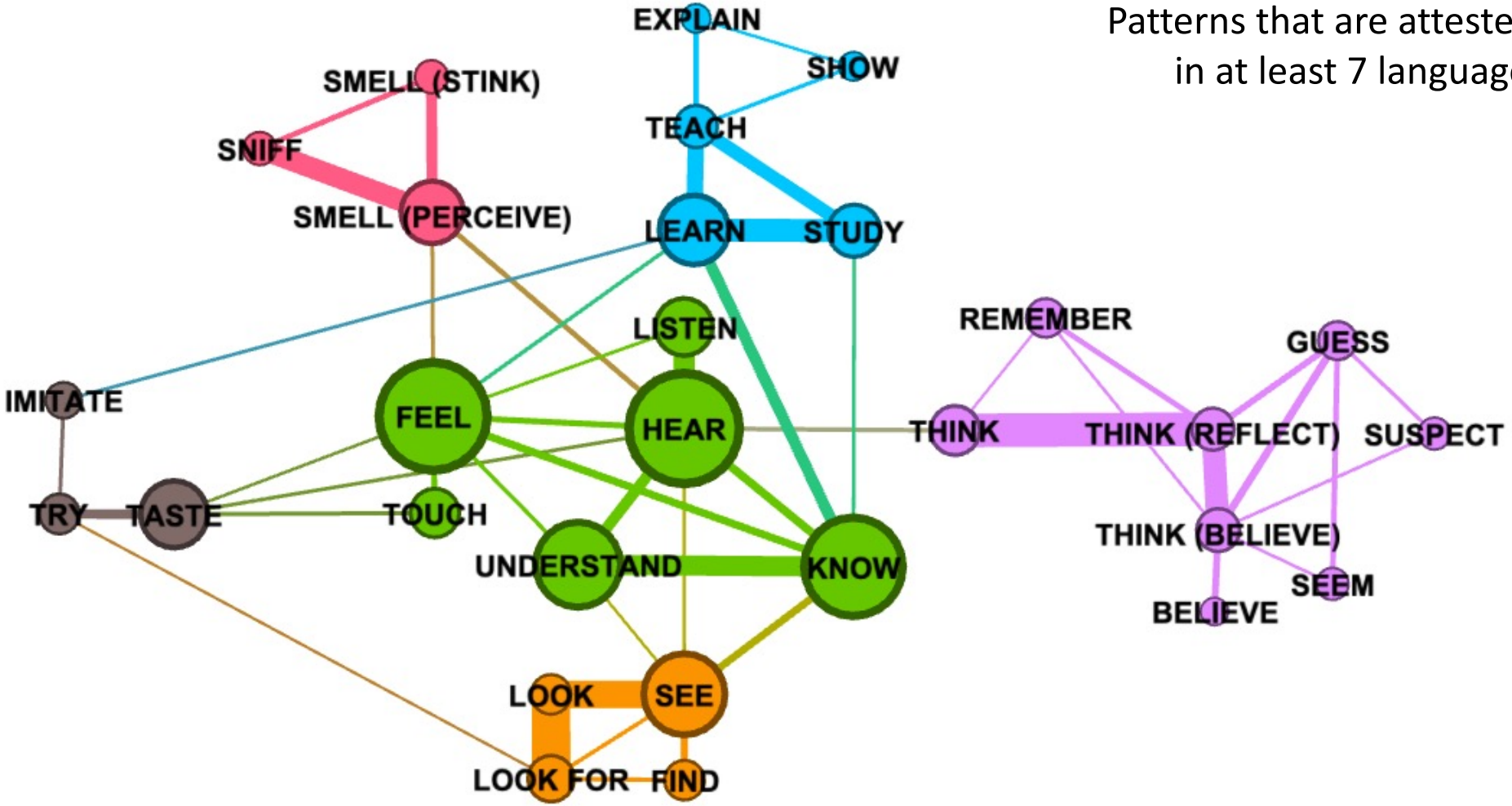
37 meanings

1947 constraints

147 edges

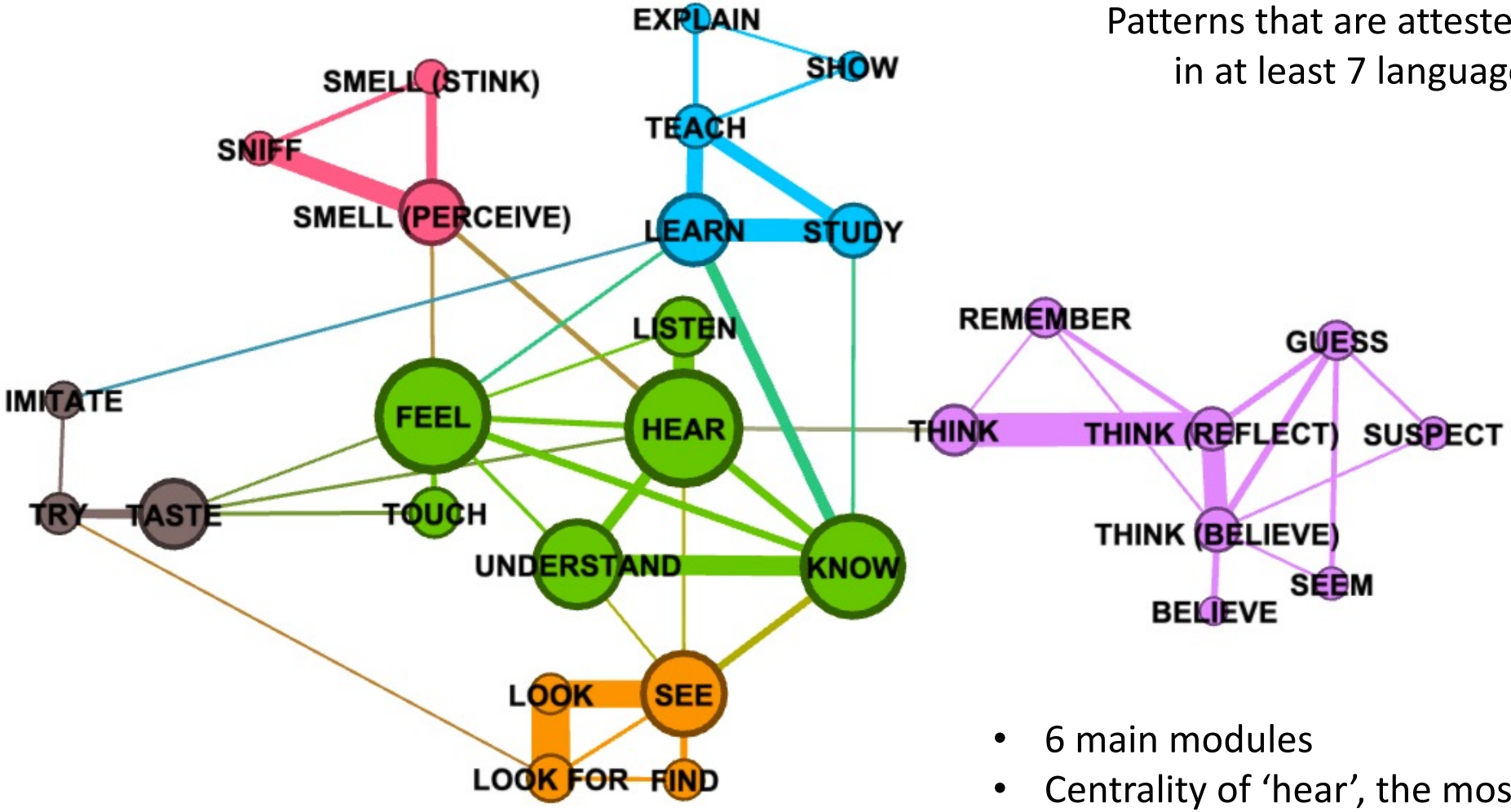
Towards a semantic map of perception/cognition concepts

Patterns that are attested in at least 7 languages



Size of nodes = Eigenvector centrality
Color = modularity analysis

Towards a semantic map of perception/cognition concepts



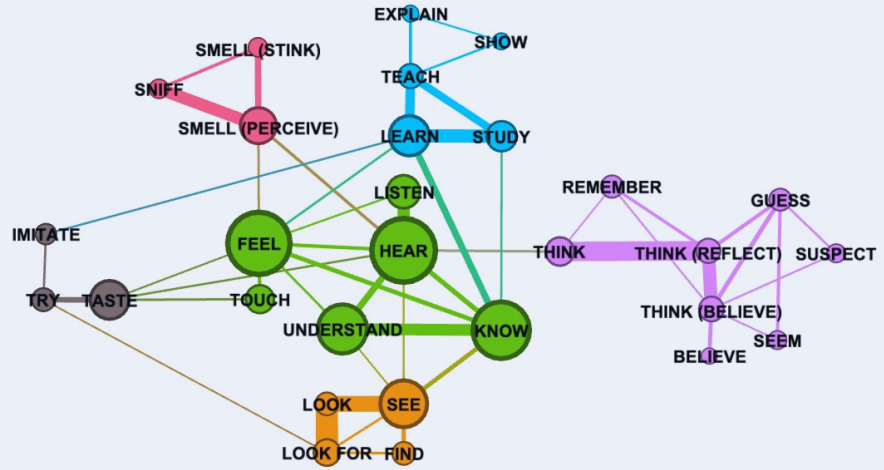
Patterns that are attested in at least 7 languages

- 6 main modules
- Centrality of 'hear', the most strongly connected with cognition concepts

Size of nodes = Eigenvector centrality
Color = modularity analysis

Towards a semantic map of perception/cognition concepts

In line with the last generalizations about perception and cognition verbs in the literature:



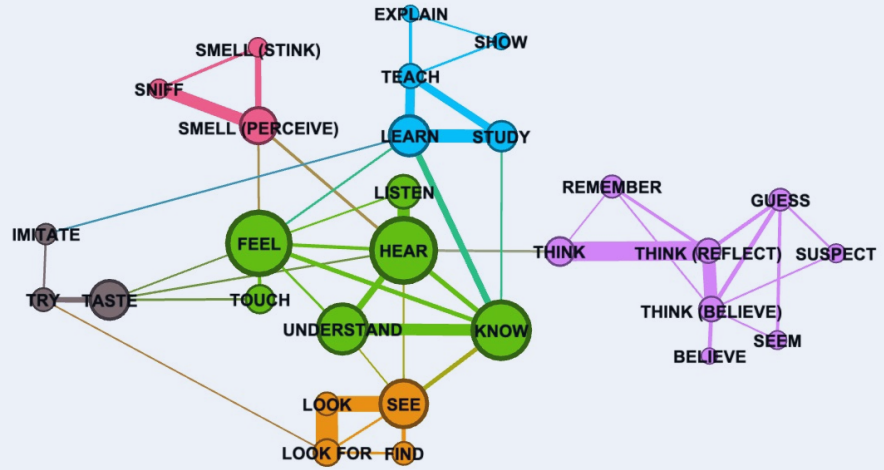
- 6 main modules
- Centrality of ‘hear’ strongly connected with cognition concepts

Towards a semantic map of perception/cognition concepts

In line with the last generalizations about perception and cognition verbs in the literature

see > hear > touch > taste, smell

Viberg's (1983) hierarchy of sense modalities



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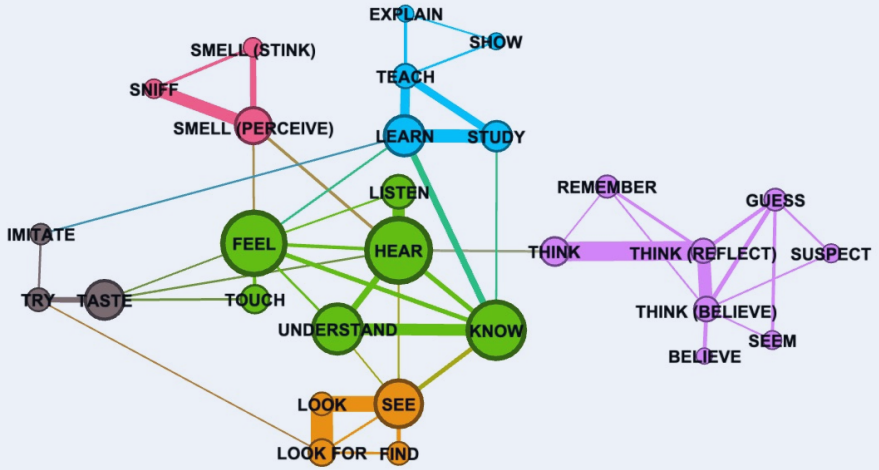
In line with the last generalizations about perception and cognition verbs in the literature

see > hear > touch > taste, smell

Viberg's (1983) hierarchy of sense modalities

Universal link between intellection and sight

Sweetser (1990)

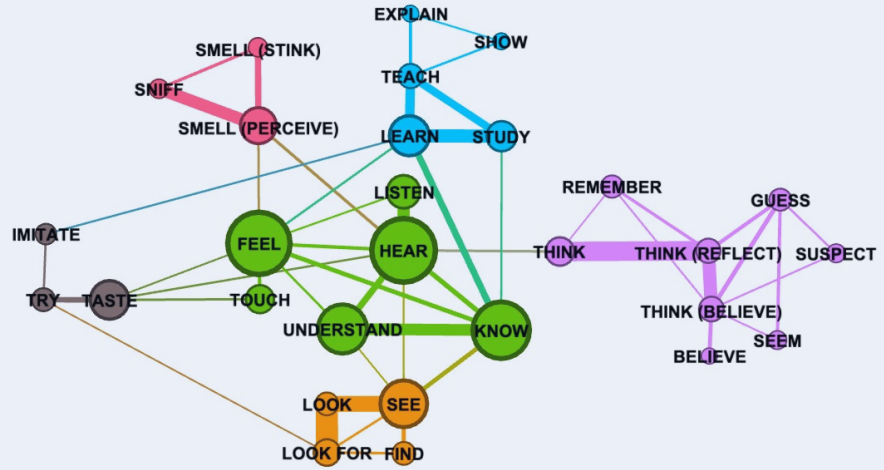


- 6 main modules
- Centrality of 'hear' strongly connected with cognition concepts

Towards a semantic map of perception/cognition concepts

In line with the last generalizations about perception and cognition verbs in the literature

Challenged by more recent studies, such as Evans and Wilkins (2000), Vanhove (2008), Guerrero (2010)

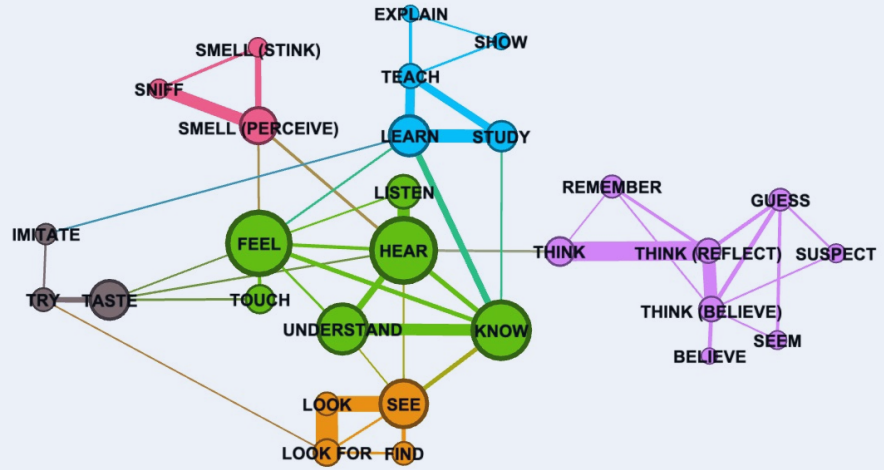


- 6 main modules
- Centrality of 'hear' strongly connected with cognition concepts

Towards a semantic map of perception/cognition concepts

In line with the last generalizations about perception and cognition verbs in the literature:

"[t]here is hardly any doubt that universal claims concerning the preferred status of 'vision' (e.g., Viberg 1983; Sweetser 1990) are highly Eurocentric, and do not hold for the majority of non Western societies"
(Aikhenvald & Storch 2013)



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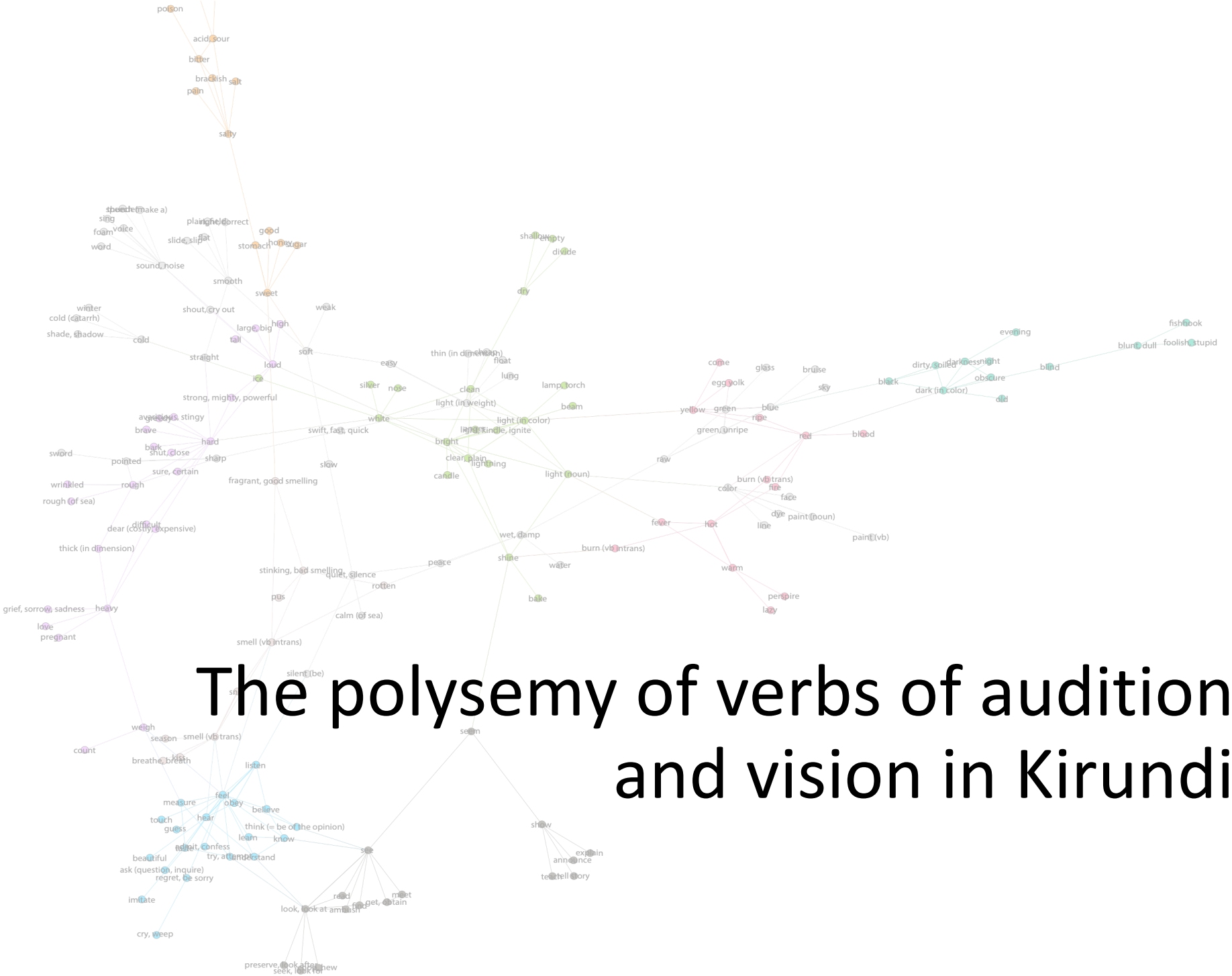

The polysemy of verbs of audition and vision in Kirundi

Perception and cognition in Kirundi

"every language has a way of referring to basic sources of sensory perception" (Aikhenvald and Storch, 2013:1)

<table>
<tr><th></th><th colspan="2">Perceiver-oriented</th><th colspan="2">Perceived-Oriented (Phenomenon)</th></tr>
<tr><th>Sensory modality</th><th>Activity</th><th>Experience</th><th colspan="2">Copulative</th></tr>
<tr><td>Vision</td><td>Kurāba/LOOK₁</td><td>Kubóna/ SEE</td><td colspan="2">Gusa /LOOK₂
Kubóneka /SEE+NEUT
Kunêzērwa * / BE HAPPY</td></tr>
<tr><td>Hearing</td><td>Kwûmviriza /
HEAR+ APPL+APPL+CAUS</td><td rowspan="3">Kwûmva /
HEAR</td><td rowspan="3">Kwûmvīkana / HEAR +NEUT+ASSOC</td><td>Gusa/SOUND
Kuvúga/SOUND
Kunêzērwa * / BE HAPPY</td></tr>
<tr><td>Touch</td><td>Gukórakora/TOUCH-TOUCH
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<tr><td>Smell</td><td>Kwîmotereza/
REFL+SMELL+APPL+CAUS
Kumōtēra/SMELL+APPL</td><td>Kumōterwa
SMELL+APPL+PASS</td><td>Kumōta /SMELL</td></tr>
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Basic Verbs of Perception in Kirundi

Perception and cognition in Kirundi

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Perception and cognition in Kirundi

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	Perceiver-oriented		Perceived-Oriented (Phenomenon)	
Sensory modality	**Activity**	**Experience**	**Copulative**	
Vision	*Kurāba/LOOK$_1$*	*Kubóna/* ***SEE***	***Gusa /LOOK$_2$*** *Kubóneka* ***/SEE****+NEUT* ***Kunêzērwa * / BE HAPPY***	
Hearing	*Kwûmviriza /* ***HEAR+ APPL+APPL+CAUS***	*Kwûmva /* ***HEAR***	*Kwûmvīkana /* ***HEAR +NEUT+ASSOC***	***Gusa/SOUND*** *Kuvúga/SOUND* ***Kunêzērwa * / BE HAPPY***
Touch	*Gukórakora/TOUCH-TOUCH* *Gukora (ku)/Touch (on)*			*Kwôroha*/BE SOFT*
Taste	*Guhônja/TASTE*			*Kuryôha*/BE TASTY*
Smell	*Kwîmotereza/* *REFL+****SMELL****+APPL+CAUS* *Kumōtēra/****SMELL****+APPL*	*Kumōterwa* ***SMELL****+APPL+PASS*		*Kumōta* ***/SMELL***

Basic Verbs of Perception in Kirundi

Perception and cognition in Kirundi

		Root verb	***Root Verb + extensions***	**TOT**
Vision	***Kubóna*** "see"	14727	4208	18935
	Kurāba "look$_1$ " ***Gusa*** "look$_2$"	7221 152	196 0	7417 152
Hearing	***Kwûmva*** "hear"	11415	6337	17752
Touch	***Gukora (ku)/****Touch (on)*	234	51	285
Taste	***Guhônja*** "to taste/give a small quantity of sth (edible/drinkable) to determine its quality"	9	0	9
smell	***Kumōta*** " to smell"	68	71	139

Distribution of Kirundi Verbs of Perception in the corpus

Perception and cognition in Kirundi

- Distribution of vision verbs *Kubóna* ‘see’ and *Kurāba* ‘look’

Lexeme	Hear	Listen	See	Touch (feel)	Smell (perceive)	Taste (something)
Kubóna ‘see’	0	0	8942	0	0	0
Kurāba ‘look’	0	0	3261	0	0	0

- *Corpus search attest no cross-modal meaning extension for visual verbs.*
- *However, elicitation tests revealed that visual perception verbs can extend to meaning like ‘to search, to check, to choose’ based on all the sense modalities (except Kubóna ‘see’ which cannot extend to taste modalities).*

Perception and cognition in Kirundi

- Distribution of vision verbs *Kubóna* 'see' and *Kurāba* 'look'
- Meaning extensions of vision verbs *Kubóna* 'see' and *Kurāba* 'look'

To search, to find (by listening)

(1) Rāba Thomas ikáséti ivugá nêzá.

Rāb-a	Thomas	***ikáséti***	***ivugá***	***nêzá***
IMP-to.look-FV	Thomas	AUG-NP-tape	REL-3SG-to.sound-FV	good

Lit: Thomas, **look** a tape that sounds good.
Trans: Thomas, ***find/look for*** an undamaged tape. (= by listening to the collected radio tapes)

To check (by touching)

(2) Rāba Thomas impŭzu kó zūmyé.

Rāb-a	Thomas	i-n-hŭzu	ko	zi-ûm-ye
IMP-to.look-FV	Thomas	AUG-NP-cloth	that	3PL-to.be.dry-PFV

Lit: Thomas, **Look** cloths that they are dry.
Trans: Thomas, ***check*** if cloths are thoroughly dry. (= by touching them)

Perception and cognition in Kirundi

- Distribution of vision verbs *Kubóna* 'see' and *Kurāba* 'look'
- Meaning extensions of vision verbs *Kubóna* 'see' and *Kurāba* 'look'

To choose (by smelling)

(3) Rāba Thomas amavúta amōtá nêzá.

Rāb-a	Thomas	a-ma-vúta	a-mōt-á	nêzá
IMP-to.look-FV	Thomas	AUG-NP-body.lotion	REL-3SG-to.smell-FV	good

Lit: Thomas, **Look** body lotion that smells good.
Trans: Thomas, ***choose*** a body lotion that has a sweet smell.

To check (by tasting)

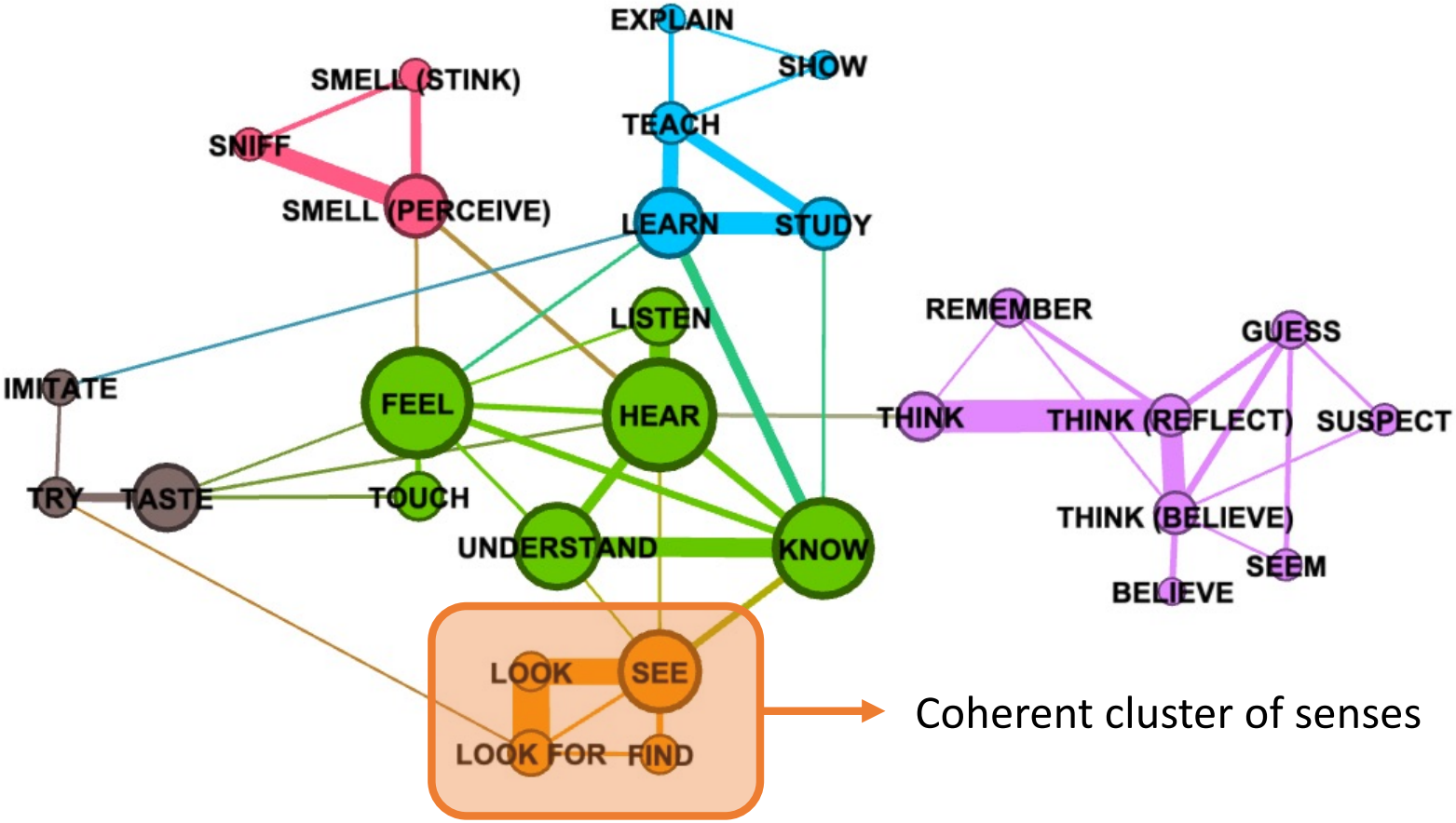
(4) Rāba Thomas indyá kó zihīyé.

Rāb-a	Thomas	indyá	kó	zi-hī-yé
IMP-to.look-FV	Thomas	AUG-NP-food	that	3PL-to.be.cooke-PFV

Lit: Thomas, ***Look*** food that they are cooked.
Trans: Thomas, ***check*** **if** the food is cooked through.

Perception and cognition in Kirundi

- Distribution of vision verbs *Kubóna* ‘see’ and *Kurāba* ‘look’
- Meaning extensions of vision verbs *Kubóna* ‘see’ and *Kurāba* ‘look’



Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus

lexemes	Hear	Listen	See	Touch (feel)	Smell (perceive)	Taste (something)
Kwûmva 'hear'	6724	351	0	17	10	15
Kwûmviriza 'listen' HEAR+APPL+APPL+CAUS	88	899	0	1	1	5
Kwûmvīra 'listen' HEAR+APPL	0	8	0	0	0	0

(5) […]yūmva ingoma zirikó ziravúga. (*L'arbre mémoire.txt*)

To hear

a-a-ûmv-a	i-n-goma	zi-ri-ko	zi-ra-vúg-a
3SG-PST-to.hear-FV	AUG-NP-drum	3PL-to.be-PROG	3PL-DISJ-to.speak-FV
Lit: […] he heard	drums	they were	they speak

Trans: […] he ***heard*** rhythmic beats of drums.

Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus

(6) umvīra uwarí kumwé nabó atwĭgānire (*Abatagatifu bashasha.txt*)

To listen

ûmv-ir-a	u-à-ri	kumwé	na-bó	a-tu-îgān-ir-e
IMP-to.hear-APPL-IMPFV	REL-3SG-PST-to.be together		CONN-DEM	3SG-OBJ-to.narrate-APPL-IPFV

Lit: ***Hear to*** who was together with and them he us narrate for
Trans: ***Listen to*** one of them; he is going to tell us about it.

(7) Ndûmviriza icó Imâna iyāgá (*Amazaburi 2.txt*)

To listen

N-ra-ûmv-ir-ir-i-a	i-ki-ó	I-mâna	i-yāg-a
1SG-DISJ-to hear-APPL-APPL-CAUS-FV	AUG-PP-DEM	AUG-God	3SG-to.tell-FV

Lit: I ***hear*** to what God He tells
Trans: I ***listen*** to God's word.

The derived verbs *kwûmviriza* and *kwûmvīra* can express the meaning "to listen "

Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus
- Meaning extensions of *Kwûmva/iriza* 'to hear' to other modality senses

(8) Izûru rituma mpêma, nûmva akamōto, riraházarika imicăfu iricĭyemwó (*Inyigisho menyeshantara 2.txt*)

To smell

i-zûru	ri-túm-a	n-hēm-a	n-ûmv-a	a-ka-mōt-o
AUG-nose	3SG-to.make-FV	1SG-to.breathe-FV	1SG-to.hear-FV	AUG-NP-to.smell.nice-FV
ri-házarik-a	i-mi-căfu	i-ri-cī-ye-mwó		
3SG-to.stop-FV	AUX-NP-dirt	3SG-PP-to.pass.LOC		

Trans: The nose allows me to breathe and ***smell***. It blocks dirt that pass through.

(9) ukûmviriza ukûmva kó bisôsá nêzá? (RPA_Akayabagu_Claude_Betterave.txt)

To taste

u-ka-ûmv-ir-ir-i-a			u-ka-ûmv-a
2SG-CONSEC-to.hear-APPL-APPL-CAUS-FV			2SG-CONSEC-to.hear-FV
Ko	bi-sôs-a	nêzá	
That	3PL-to.be.sweet.FV	enough	

Lit: You then ***listen*** for you then hear that they are sweet enough.
Trans: You then ***taste*** to find out if it is sweet enough.

Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus
- Meaning extensions of *Kwûmva/iriza* 'to hear' to other modality senses

To feel (experience touching)

(10) Narí mpagaze nk'ŭku, máze nūmva ikūntu kīmfashé ukubóko.
(IcaGatandatu.txt)

n-à-ri	n-hágarar-ye	nka	uku	mar-ye
1SG-PST-to.be	1SG-to.stand-IMPF	like/as	DEM	to.finish-PFV
n-ûmv-a	i-ki-ntu	ki-n-fát-ye		u-ku-bóko
1SG-to.hear-FV	AUG-NP-thing	3SG-PP_{1SG}- to.hold-PFV		AUG-NP-arm

Lit: I was I standing like this finished I ***hear*** thing it me hold arm.
Trans: I was standing like this and ***felt*** something holding my arm.

Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus
- Meaning extensions of *Kwûmva/iriza* 'to hear' to other modality senses

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n-ûmv-a	i-ki-ntu	ki-n-fát-ye		u-ku-bóko
1SG-to.hear-FV	AUG-NP-thing	3SG-PP_{1SG}- to.hold-PFV		AUG-NP-arm

Lit: I was I standing like this finished I ***hear*** thing it me hold arm.
Trans: I was standing like this and ***felt*** something holding my arm.

The initial stimulus which motivates human perception is from the external word (Wierzbička, 1980, p. 106)

However, Kirundi speakers also use the same hearing verb *kwumva* to express experience from the inner world–feelings.

Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus
- Meaning extensions of *Kwûmva/iriza* 'to hear' to other modality senses

To feel (experience touching)

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n-à-ri	n-hágarar-ye	nka	uku	mar-ye
1SG-PST-to.be	1SG-to.stand-IMPF	like/as	DEM	to.finish-PFV
n-ûmv-a	i-ki-ntu	ki-n-fát-ye		u-ku-bóko
1SG-to.hear-FV	AUG-NP-thing	3SG-PP_{1SG}- to.hold-PFV		AUG-NP-arm

Lit: I was I standing like this finished I ***hear*** thing it me hold arm.
Trans: I was standing like this and ***felt*** something holding my arm.

To feel (emotionally)

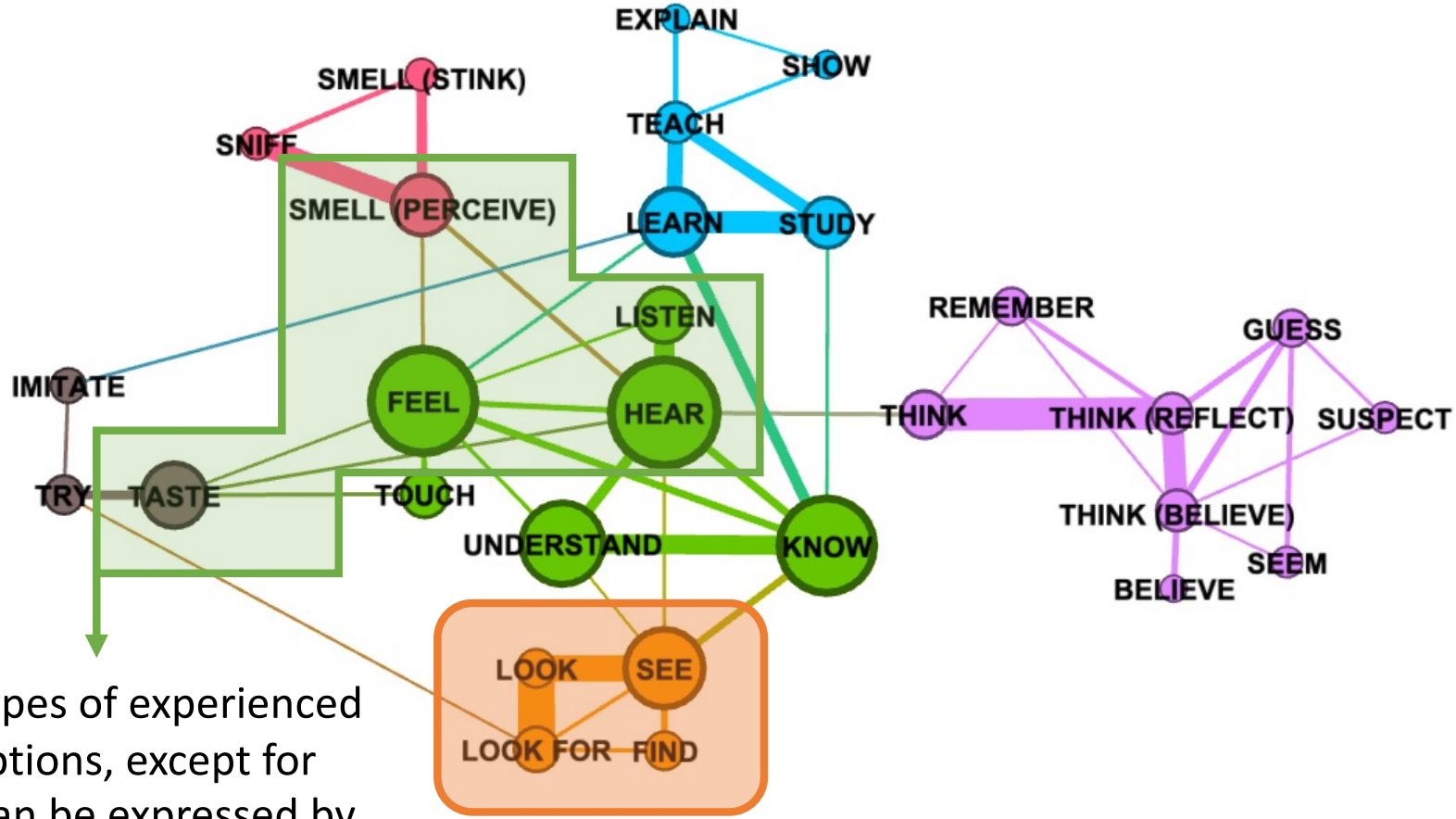
(11) nūmva intŭntu nyĭnshi (UbwuzureBushasha.txt)

n- ûmv-a	i-ntŭntu	nyĭnshi
1SGt-to.hear-FV	AUG-sadness	a.lot

Lit: I ***hear*** sadness a lot.
Trans: I ***feel*** very sad.

Perception and cognition in Kirundi

- Distribution of the multimodal hearing verb *Kwûmva* in the corpus
- Meaning extensions of *Kwûmva/iriza* ‘to hear’ to other modality senses



All the types of experienced perceptions, except for vision, can be expressed by *kwûmva*

Perception and cognition in Kirundi

- Beyond perception?

Form	Feeling	Cognition	Attention-getter	socializing
Kwûmva 'hear'	5050	1148	97	123
Kwûmviriza 'listen' HEAR+APPL+APPL+CAUS	0	5	2	4
Kwûmvīra 'listen' HEAR+APPL	0	0	0	2
kwîyumvīra *'think'* REFL+HEAR+APPL	0	1187	0	222

Perception and cognition in Kirundi

- Beyond perception?

Form	Feeling	Cognition	Attention-getter	socializing
Kwûmva 'hear'	5050	1148	97	123
Kwûmviriza 'listen' HEAR+APPL+APPL+CAUS	0	5	2	4
Kwûmvīra 'listen' HEAR+APPL	0	0	0	2
kwîyumvīra *'think'* REFL+HEAR+APPL	0	1187	0	222

Perception and cognition in Kirundi

- Beyond perception?

To think (cognition)

(12) jewe numva tworekezaho amanita 7 (*PLENIERE 1.txt*)

Jewe	n-ø-umv-a	tu-oo-rek-ir-i-a-ho	a-ma-nota 7
I	1SG-PRS-hear-IMPFV	1PL-MOD-leave-APPL-CAUS-IMPFV-LOC	AUG-NP-mark 7 (seven)

Lit: I ***hear*** we leave there marks seven.
Trans: I ***think*** maintaining seven would be fine.

To get (attention)

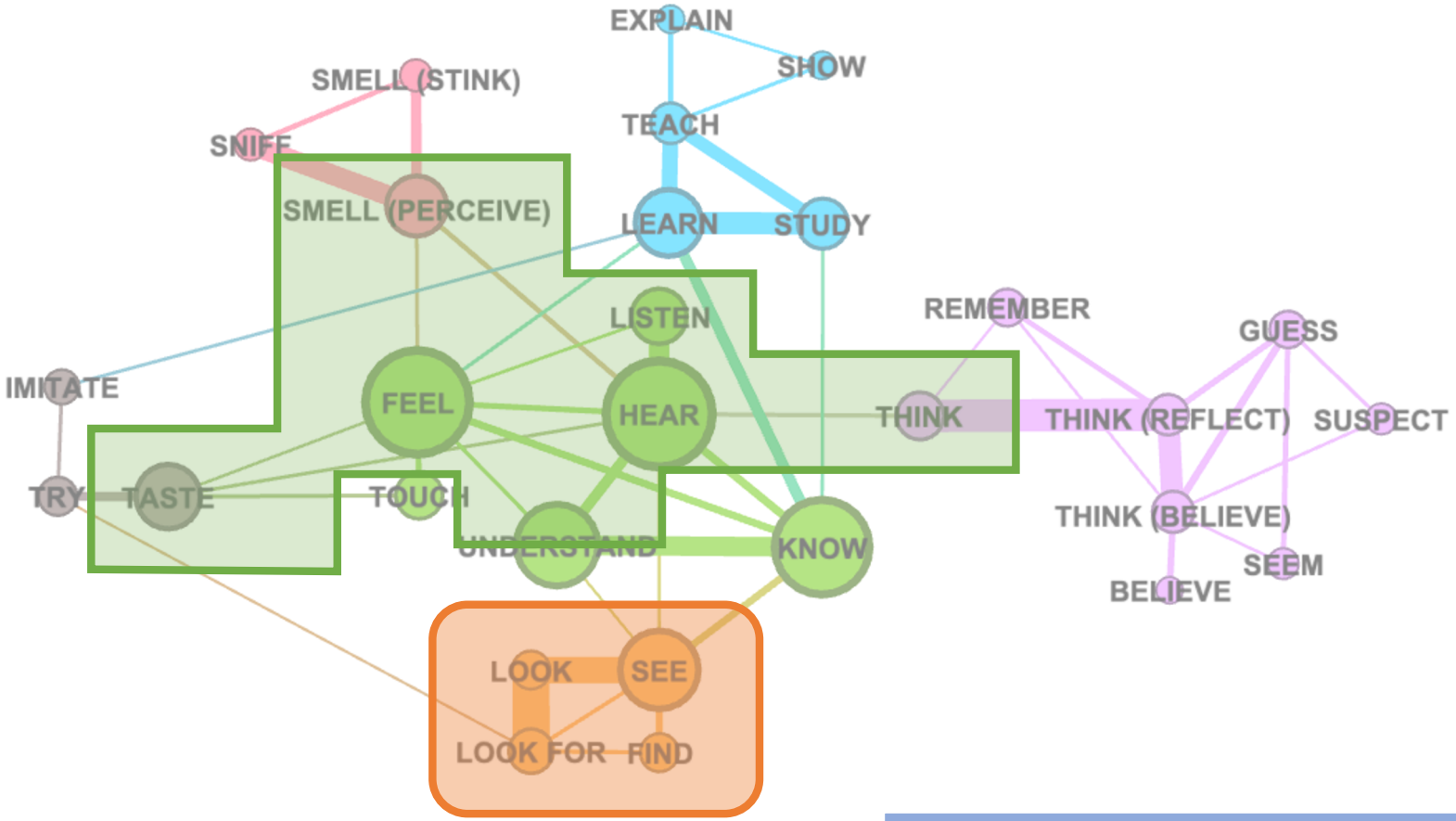
(13) […], urumva? **Kuko*[…]*** (*Conversation_2016-09-03.txt*)

[…], u-ra-umv-a?	kuko […]
[…], 2SG-DISJ-hear-IMPFV?	Because […]

Lit: […], you **hear** ? because**[…]**
Trans: […], ***are you getting*** (me)? Because […]

Perception and cognition in Kirundi

- Beyond perception?



Perception and cognition in Kirundi

- Beyond perception?
- But the verbs of **visual experience** are most commonly extending to cognition, even with meaning such as ‘to imagine’

(14)

A: Salon ministre bimwe binini binini urabibona.

Salon ministre bi-imwe bi-ninibi-niniu-ra-bi-bon-a.

Sofa NP-some NP-big NP-big 2SP-FOC-OBJ$_{3PL}$- see-IMPFV

Lit: Sofas those they big they big you them ***see***

Trans: Those very big sofas. Do you ***know*** them?

To know

B: Ndabibona.

n-ra-bi-bon-a.

1SG-FOC- OBJ$_{3PL}$- see-IMPFV

Lit: I them ***see***

Trans: I ***know*** them

Perception and cognition in Kirundi

- Beyond perception?
- But the verbs of **visual experience** are most commonly extending to cognition, even with meaning such as ‘to imagine’

To think

(15) Ubona amatora yo muri 2015 azoba? (*Itsitso_Ikiganiro.txt*)

U-Ø-bon-a	**a-ma-tora**	**i-o**	**muri**	**2015**	**a-zo-ba?**
2SG-PRS-see-IMPFV	AUG-NP-election	PP-DEM	in	2015	AUG-FUT-be

Lit: you ***see*** election of in 2015 they will be
Trans: do you ***think*** 2015 elections will take place?

To imagine

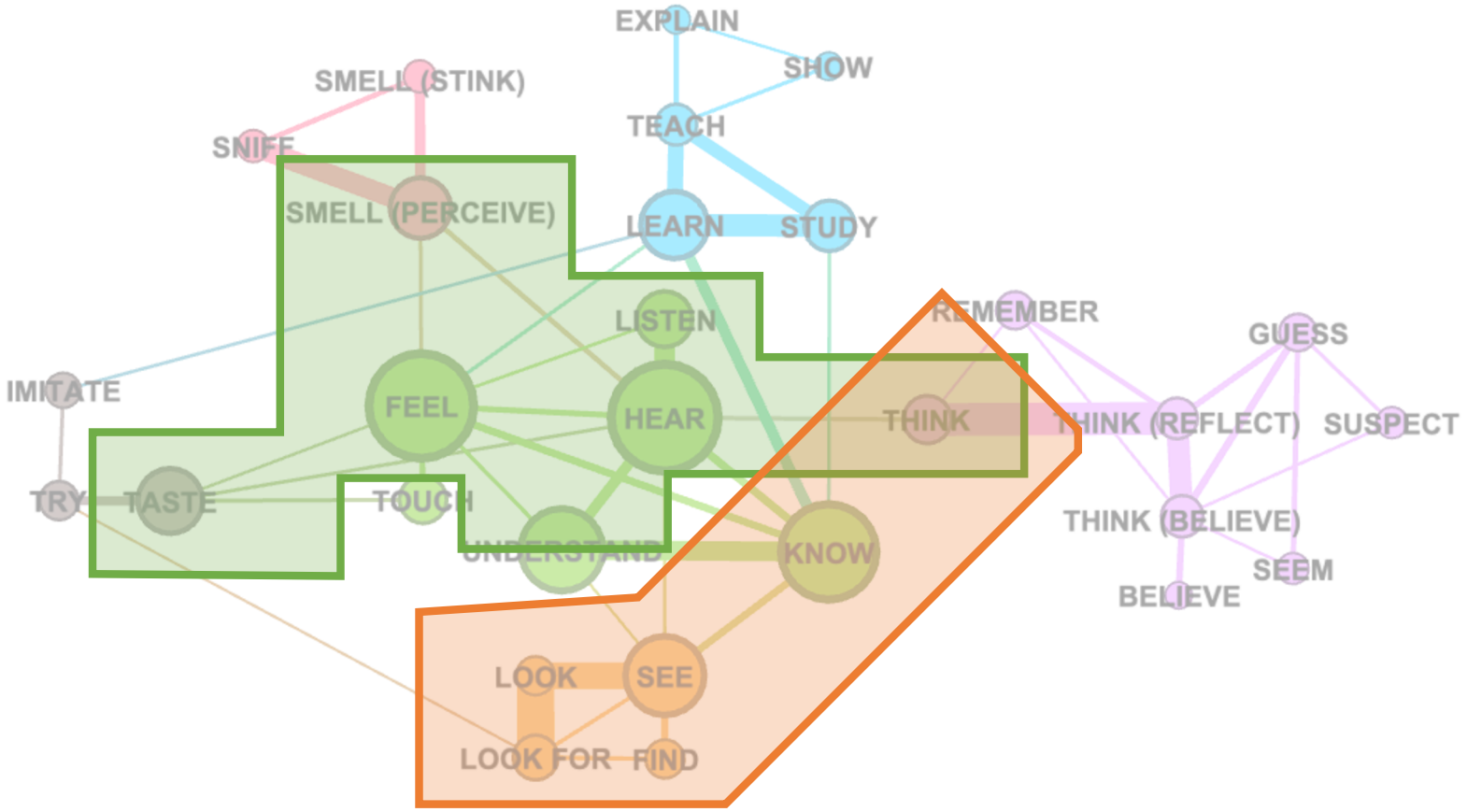
(16) Kubona atinya Nzigirabarya! (*Bugaboburihabwa.txt*)

Ku-bon-a	a-ø-tiny-a	Nzigirabarya!
INF-***see-IMPFV***	3SG-PRS-be.afraid.of	Nzigirabarya!

Lit: to see he is afraid of Nzigirabarya!
Trans: *Imagine* that he is afraid of Nzigirabarya!

Perception and cognition in Kirundi

- Beyond perception?
- But the verbs of **visual experience** are most commonly extending to cognition, even with meaning such as ‘to imagine’



Perception and cognition in Kirundi

- Beyond perception?
- But the verbs of **visual experience** are most commonly extending to cognition, even with meaning such as 'to imagine'

Cognition is not only SEE-ing (Sweetser 1990), but both SEE-ing and HEAR-ing

Ibarretxe-Antuñano (2013: 324) proposes a general COGNITION IS PERCEPTION metaphor

'***Ikibwîrwa n'icûmva icerekwa n'ikibona***' (Kirundi saying; Rodegem 1961, p. 98)

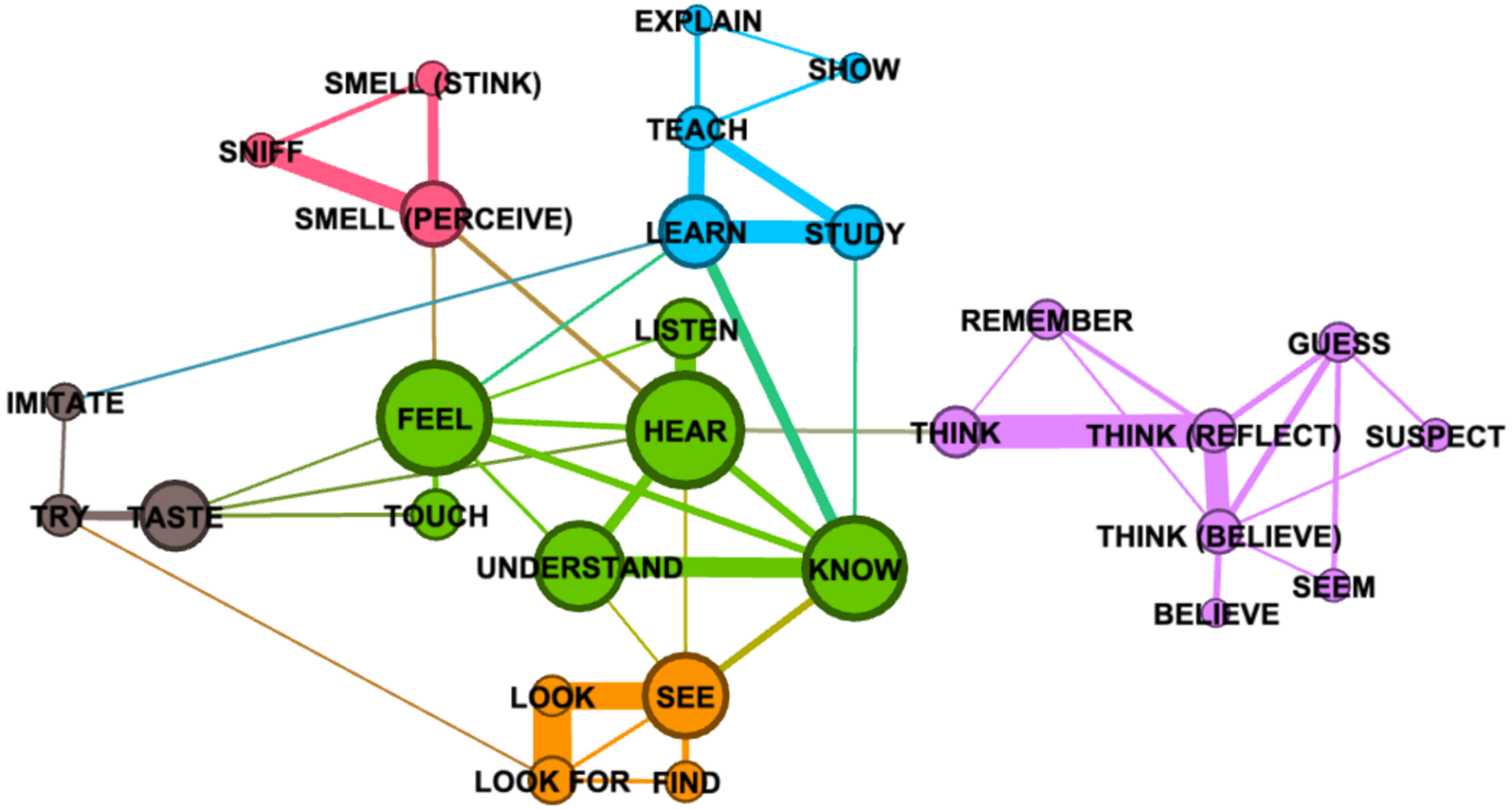
Lit: one talks to a person who can hear and shows something to a person who can see.

Trans: Only he who has the will ***to listen*** and ***look at*** what is being shown can ***understand*** and ***learn*** from the delivered message.

Contrasting Kirundi with Ancient Egyptian

Perception and cognition – Classical Egyptian

Perception

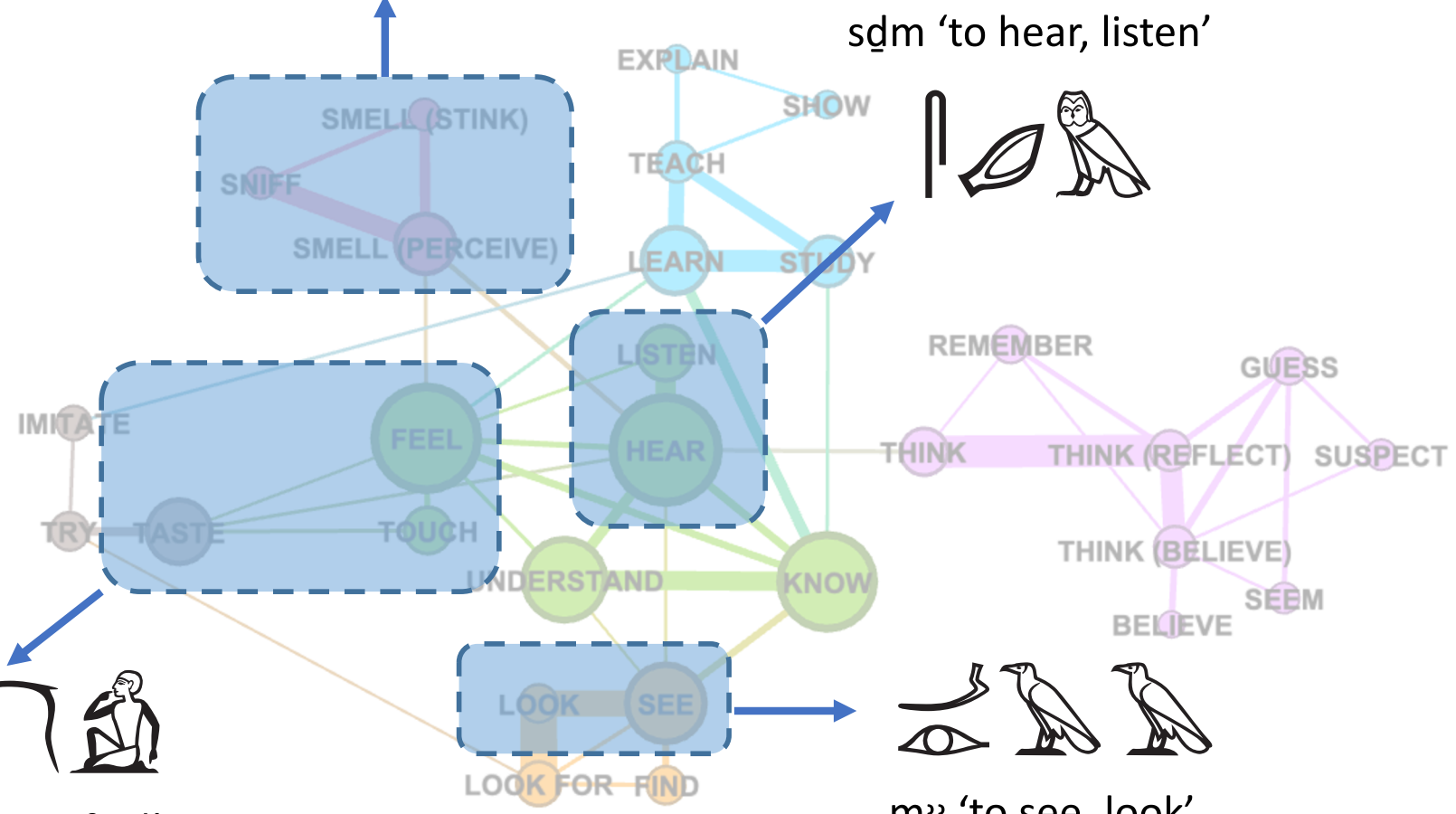


Perception and cognition – Classical Egyptian

sn ‘to smell, sniff, kiss’

Perception

sḏm ‘to hear, listen’



dp ‘to taste, feel’

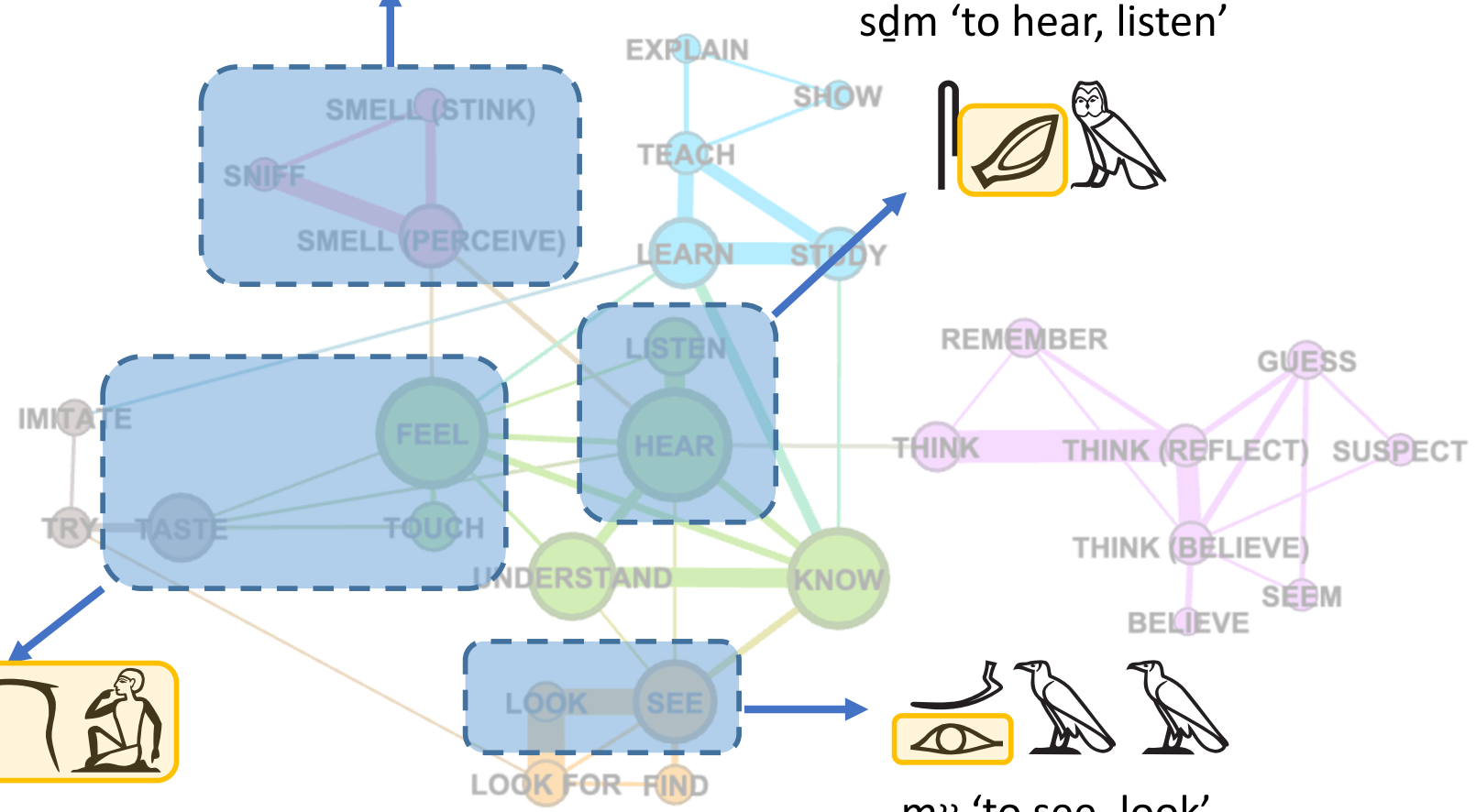
mȝȝ ‘to see, look’

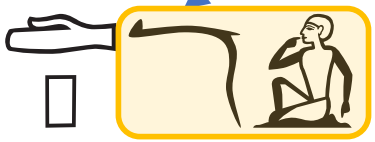
Perception and cognition – Classical Egyptian

sn ‘to smell, sniff, kiss’

Perception

sḏm ‘to hear, listen’



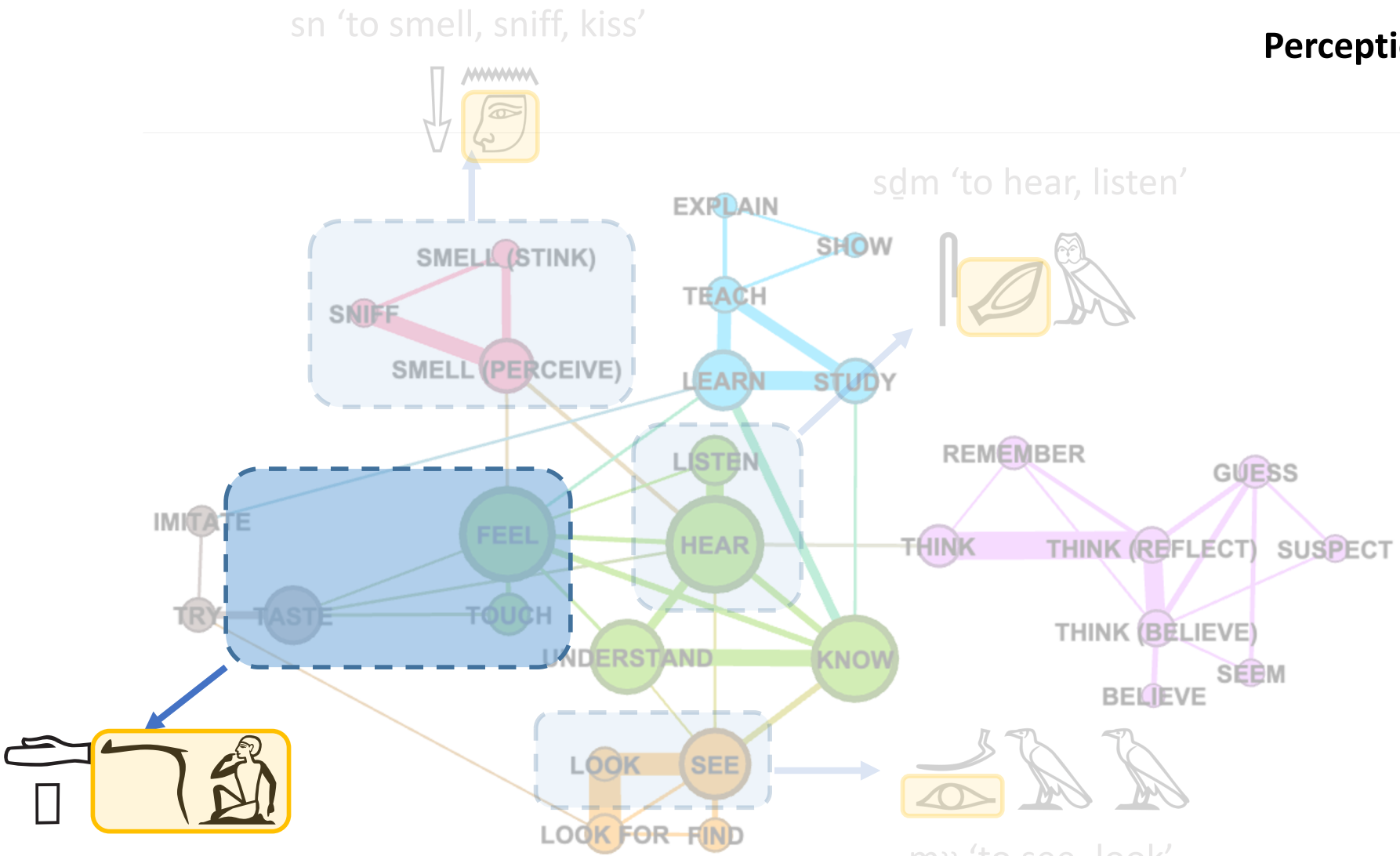


dp ‘to taste, feel’

mȝȝ ‘to see, look’

Perception and cognition – Classical Egyptian

Perception



Perception and cognition – Ancient Egyptian

„Ich habe seinen Anblick geschmeckt …“

Verben der Wahrnehmung
und die semantischen Beziehungen zwischen Perzeption und Kognition[1]

Elisabeth Steinbach (HU Berlin)

This article deals with the semantics of the Egyptian verb of perception dp. The prototypical meaning of this verb is ‚to taste something', but can be extended by various metaphorical extensions into the semantic fields of emotion and cognition. Theoretical considerations on the study of perception are followed by case studies to illustrate the different meanings of this sensory modality.

1. Methodisch-theoretische Vorbetrachtungen

1.1 Fünf Sinne im Alten Ägypten?

Die Wahrnehmung bzw. Sensorik des Menschen basiert sowohl auf äußeren Einwirkungen durch die Umwelt als auch auf einem inneren Befinden des Körpers. Unsere Sinnesorgane nehmen unterschiedliche Reize als Stimuli auf und setzen diese in Empfindungen um. Allgemein bezieht man sich bei Betrachtungen von Sinneswahrnehmungen auf die folgenden fünf Sinnesmodalitäten:

- Sehsinn – visuelle Wahrnehmung
- Hörsinn – auditive Wahrnehmung
- Tastsinn – haptisch-taktile Wahrnehmung
- Geruchssinn – olfaktorische Wahrnehmung
- Geschmackssinn – gustatorische Wahrnehmung

Eine Schwierigkeit bei der Betrachtung von Sinneswahrnehmungen im Alten Ägypten ist zunächst die Tatsache, dass es, im Gegensatz etwa zur antiken griechischen Philosophie[2], m. W. keinen innerägyptischen Diskurs über *Wahrnehmung* gibt. Hinweise auf die Anzahl an Sinnesmodalitäten lassen sich aus den Textquellen erschließen, da für die einzelnen verbalen

1 Ich danke dem MAJA 4-Team für die Einladung zur Tagung und die Möglichkeit, einen Ausschnitt aus meinem Promotionsprojekt im Rahmen eines größeren Fachkreises vorstellen und diskutieren zu können. Ohne die Förderung durch den Exzellenzcluster „Topoi – The Formation and Transformation of Space and Knowledge in Ancient Civilizations" und durch das Programm „Ancient Languages and Texts" der „Berlin Graduate School of Ancient Studies" hätte dieser Beitrag nicht entstehen können. Er hat insbesondere von Gesprächen, die ich mit Mitgliedern der Topoi-Forschergruppe C-1 „Deixis and Frames of Reference: Strategies of Perspectivation in Language, Text, and Image" geführt habe, profitiert. Frank Kammerzell und Daniel Werning sei für zahlreiche Hinweise, Verbesserungsvorschläge und Korrekturen herzlich gedankt.

2 S. zur Einteilung der menschlichen Wahrnehmung in fünf Sinne G. Krapinger (Hg.), Aristoteles. Über die Seele. Griechisch / Deutsch, Stuttgart 2011, 3–139.

LingAeg 25 (2017), 373–390

Experiencing is Tasting

Perception Metaphors of *Taste* in Ancient Egyptian

Elisabeth Steinbach-Eicke[1]

Abstract

In this contribution the different meanings of the Egyptian verb of gustatory perception *ṯp* "to taste sth." are explored. The verb has a wide range of meanings in physical, emotional and mental domains, which result from intrafield and transfield mappings. Various metaphorical extensions in the semantics of the lexeme *ṯp* are illustrated using approaches from the field of Cognitive Linguistics, particularly the framework of property selection processes.

1 Preliminary notions

1.1 Perception, metaphors and perceptive verbs

In this article, the term *perception* is used in relation to the five sensory modalities of sight, hearing, touch, smell and taste as well as their mental processing. Our knowledge of the Ancient Egyptians' interpretation of perception can only be drawn indirectly by means of the relevant source texts, as there was no word for or discourse about perception in Ancient Egypt.[2]

The discussion about the number of human senses is quite controversial and cannot be examined in this contribution. Linguistic studies on perception verbs usually refer to the five standard sensory modalities, since these five modalities are lexicalized in most of the world's languages.[3] In its treatment of the Egyptian data, this article is restricted to the standard list of five modalities, too.

Metaphors are understood in this paper as being cognitive or conceptual in nature rather than mere rhetorical devices.[4] Conceptual metaphors can be defined as mappings

1 Freie Universität Berlin (elisabeth.steinbach[at]fu-berlin.de).
The subject of the present article is an excerpt of the author's dissertation project (Humboldt-Universität zu Berlin) dealing with the semantic and syntactic behavior of perception verbs in Earlier Egyptian with a special attention to metaphorical meaning extensions.

2 "Unmittelbare Aussagen über das, was wir heute im engeren Sinne unter Sensorik verstehen, finden sich zwar nicht; dennoch wird die sinnliche Wahrnehmung implizit in Sprache und Texten thematisiert und kann […] eine besondere Komponente der Rezeption darstellen." (Verbovsek & Backes 2015: 105).

3 Strik Lievers (2007: 167–168).

4 Lakoff & Johnson (1980/2003: 3–4).

Taste metaphors in Hieroglyphic Egyptian

Elisabeth Steinbach-Eicke

This paper aims at giving an overview of the multiple meanings of the Ancient Egyptian verb of gustatory perception *ṯp* 'to taste'. Different mappings from physical onto emotional and mental domains are explained by metaphorical meaning extensions. Data from Ancient Egyptian, as a still under-represented language within studies on perceptual language, is analysed by methods from the fields of Ancient Studies and Cognitive Linguistics.

Keywords: sensory perception, senses, taste, perception verbs, cognition, Ancient Egyptian, Afro-Asiatic, hieroglyphs, Conceptual Metaphor Theory, Property Selection Processes

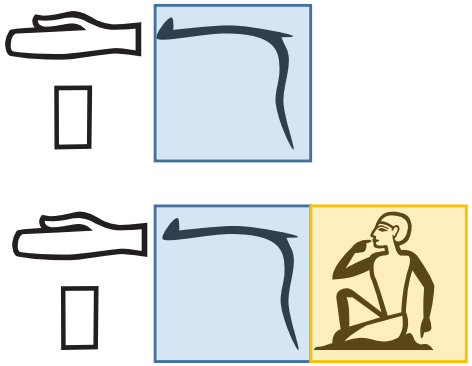
Published online: 21 February 2019
https://doi.org/10.1075/celcr.19.08ste

Chapter published in:
Perception Metaphors
Edited by Laura J. Speed, Carolyn O'Meara, Lila San Roque and Asifa Majid
[Converging Evidence in Language and Communication Research 19] 2019
▸ pp. 145–164

Steinbach-Eicke (2015, 2017, 2019) studied the senses of the verb *dp* 'to taste' in Egyptian

Perception and cognition – Ancient Egyptian

Proto Afroasiatic **dap-* (‘to touch, feel, put fingers on’)



dp ‘to taste’ Cf. Coptic ⲧⲱⲡⲉ ‘to taste’

To taste

dp ***ḥmꜣ-t*** *(Meir, Pepi-Ankh)*

taste:INF salt-F

“Tasting the salt”

(in order to check whether the bread being prepared is salty enough)

Perception and cognition – Ancient Egyptian

To feel, [experience]

n(n)	***dp-n-j***	***mn-t***	***rmjtt-s***
NEG	taste-ANT-1SG	suffering-F	like-3SG.F

"I never experienced such a suffering" *(Isis and Ra)*

To touch [activity]

dpy	***ʿb-wy=f***	***jw=f***	***mnḫ***	***ḥr***	***ʿb.wy=f***
taste:PTCP	horn-DU-3SG.M	GRND-3SG.M	thread:RES	on	horn-DU-3SG.M

"The one who touch his horn (of the god Amun), on his horns is impaled"
(Great hymn to Amun; alliteration on /t-p/)

Perception and cognition – Ancient Egyptian

To feel, [experience]

n(n)	***dp-n-j***	***mn-t***	***rmjtt-s***
NEG	taste-ANT-1SG	suffering-F	like-3SG.F

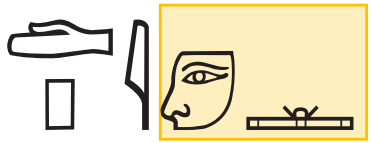
"I never experienced such a suffering" *(Isis and Ra*)

To feel [emotionally]

nn	***dp-ṯn***	***snḏ-t***	***n-t***	***ky***	***tꜣ***
NEG	taste:SBJV-2PL	fear-F	of-F	other	land

"You shall not experience the fear of another land" *(Stela Louvre C26)*

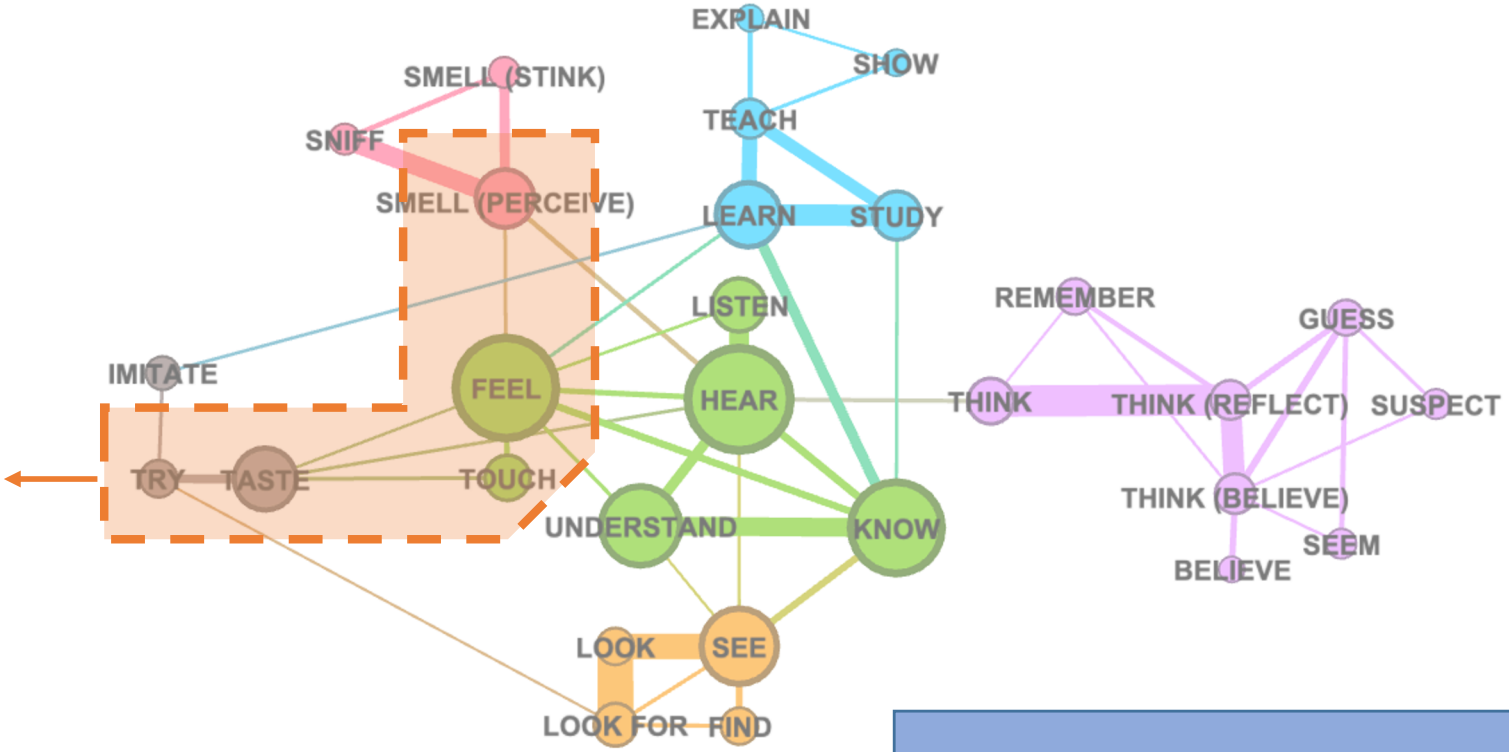
Perception and cognition – Ancient Egyptian



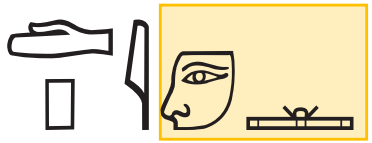
To smell

nn	***dp-f***	***t;w***	***zp-2***
NEG	taste:SBJV-3SG.M	air	twice

"He (= Apophis) shall not smell the air,
he shall not smell the air" *(Bremmer Rhind)*



Perception and cognition – Ancient Egyptian



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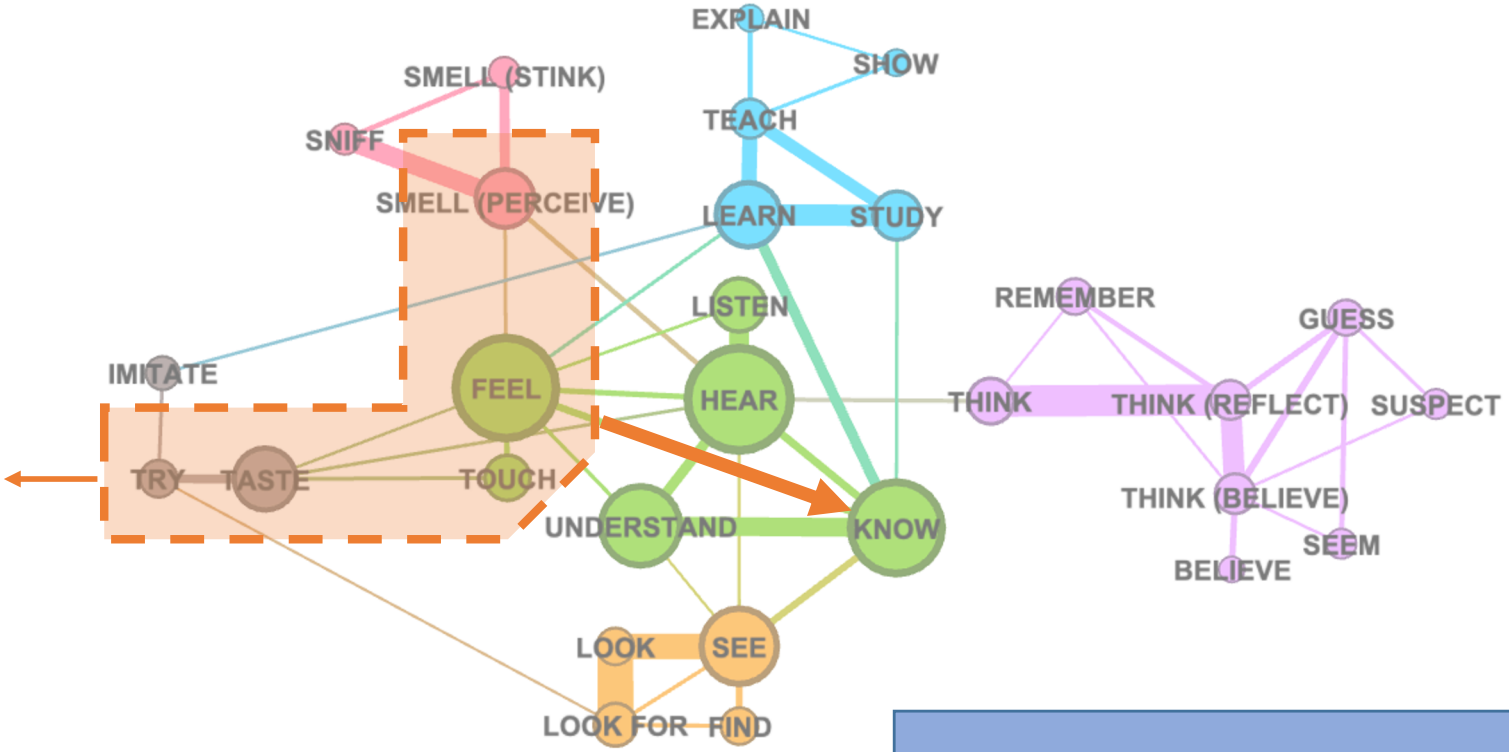


Perception and cognition – Ancient Egyptian

Winand (2016) explored the semantic extension of verbs of cognition in Earlier Egyptian (c. 2700–1350 BCE)

The Syntax-Semantics Interface in Earlier Egyptian: A Case Study in Verbs of Cognition [1]

Jean Winand

A. Foreword

What we know about Earlier Egyptian essentially comes from studies in morphology and syntax.[2] We have so far witnessed different theoretical approaches: structuralism, the "Standard Theory" (and the "not-so-standard-theory," see Collier 1990, 1994), generativism, etc. Questions that have been haunting (some) Egyptologists' nights for decades (Vernus 1997; Winand 1998; Allen 2011a; Uljas 2011) remain largely the same:

- How can forms be mapped onto functions? Can one make a parallelism between the two? If so, should one adopt a strict isomorphic parallelism or looser, polymorphic (one-to-many) sets of relations?
- How far can we work with the principle of symmetry when reconstructing verbal morphology? Should a variation that can be observed in one verbal class (e.g. the 3ae inf.) automatically be accepted for (all) other classes? If not, this raises a serious question about our ability to reconstruct paradigms in Egyptian (and probably also about the very purpose of making paradigms).
- What are the limits of use of the principle of analogy? To what extent are the emphatic forms of Later Egyptian that are morphologically marked (although there are significant differences between Late Egyptian, Demotic and Coptic) useful for understanding how the system worked in Earlier Egyptian?[3] What can we infer about the verbal system in Earlier Egyptian from the fact that the emphatic forms in Later Egyptian are distinct from the pragmatically/enunciatively "flat" forms (*sḏm.f* vs. *j.jr.f sḏm*, ⲁⲩⲥⲱⲧⲉϥ vs. ⲛⲧⲁⲩⲥⲱⲧⲉ)? To what extent does the existence of a form that is probably closest in Egyptian to a substantival form (*mrr.f*) have consequences for our analysis of the *sḏm.n.f* form? Is the parallel sufficient enough to accept that *sḏm.n.f* is a cover form at the graphic level for several morphologically distinct forms impossible to recognize because of the peculiarities of the hieroglyphic writing (critically Stauder 2014c–e and this volume)?[4] To take another viewpoint, what are the consequences, if any, of the existence of a Late Egyptian pattern specialized for sequentiality (*jw=f ḥr (tm) sḏm*) to how one should understand the morphology of the *sḏm.n=f* in Middle Egyptian?
- What use can be made of the negative (or passive) system when reconstructing the verbal paradigms of the positive (or active) forms? For instance, what can the opposition between passive *sḏm.w=f* vs. *sḏm.n.tw=f* tell us about the active *sḏm.n=f*?[5] What can we gain in our

1 My thanks are due to Stéphane Polis for fruitful discussions on semantic maps and on critical issues related to lexical semantics, and to Todd Gillen for his comments and for improving my English.

2 Curiously enough, the impact of pre-Coptic phonology, which apparently remains a German-speaking field, seems to be limited to grammarians dealing with the predicative systems of Earlier Egyptian (but see recently Allen 2013).

3 Such a bottom-up approach was instrumental in Polotsky's seminal study (Polotsky 1944).

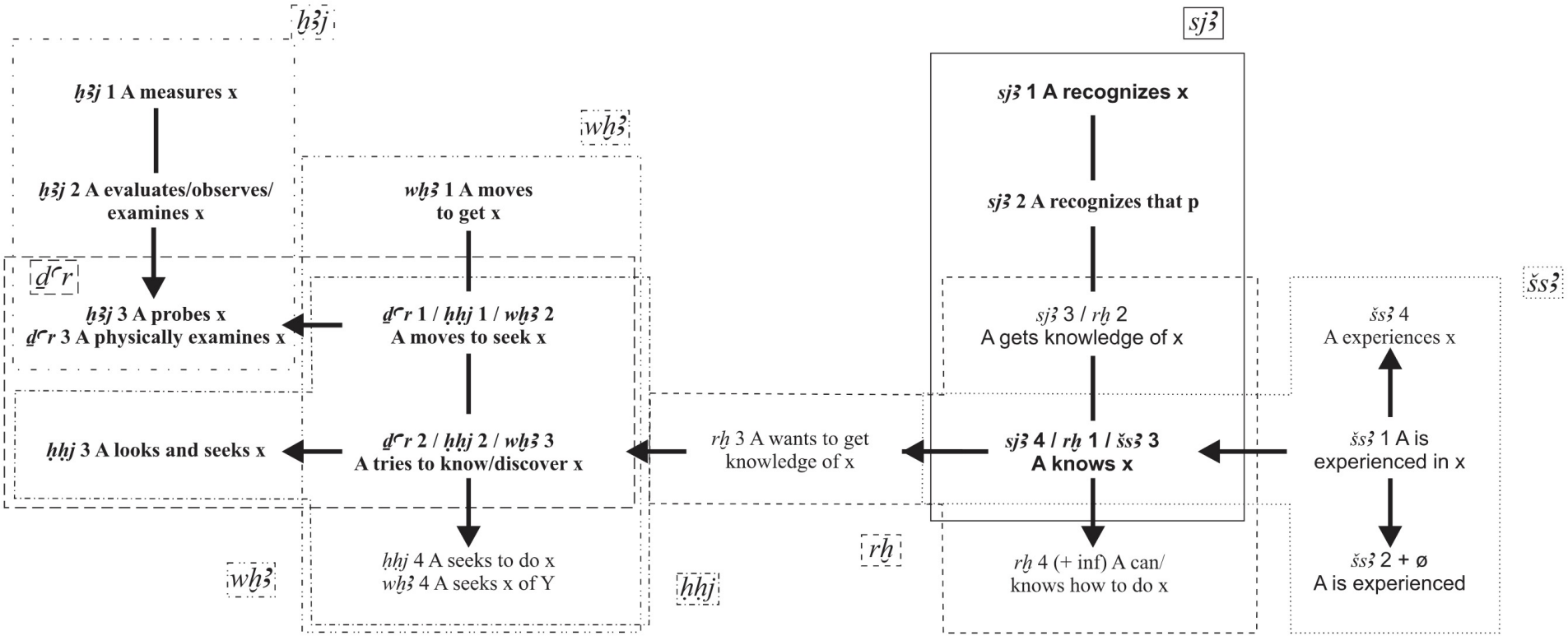
4 Once more, this was seen as pivotal in the Standard Theory: different unwritten vocalic schemes were once supposed to match different syntactic functions (see Depuydt 1986; Satzinger 1987, 1988).

5 See most recently Stauder 2014a, 235–348, arguing that the nature of the morphological and semantic contrast in the passive in fact implies a single form in the active.

Perception and cognition – Ancient Egyptian

Winand (2016) explored the semantic extension of verbs of cognition in Earlier Egyptian (c. 2700–1350 BCE)

resultative achieved achieved **achieved / unachieved** unachieved



Perception and cognition – Ancient Egyptian

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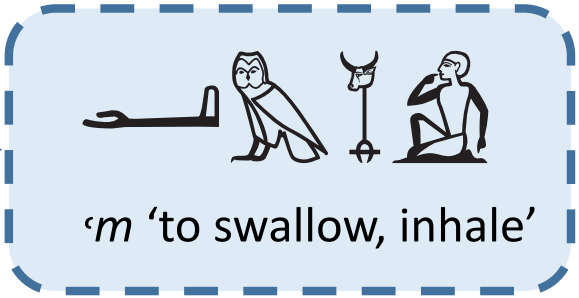
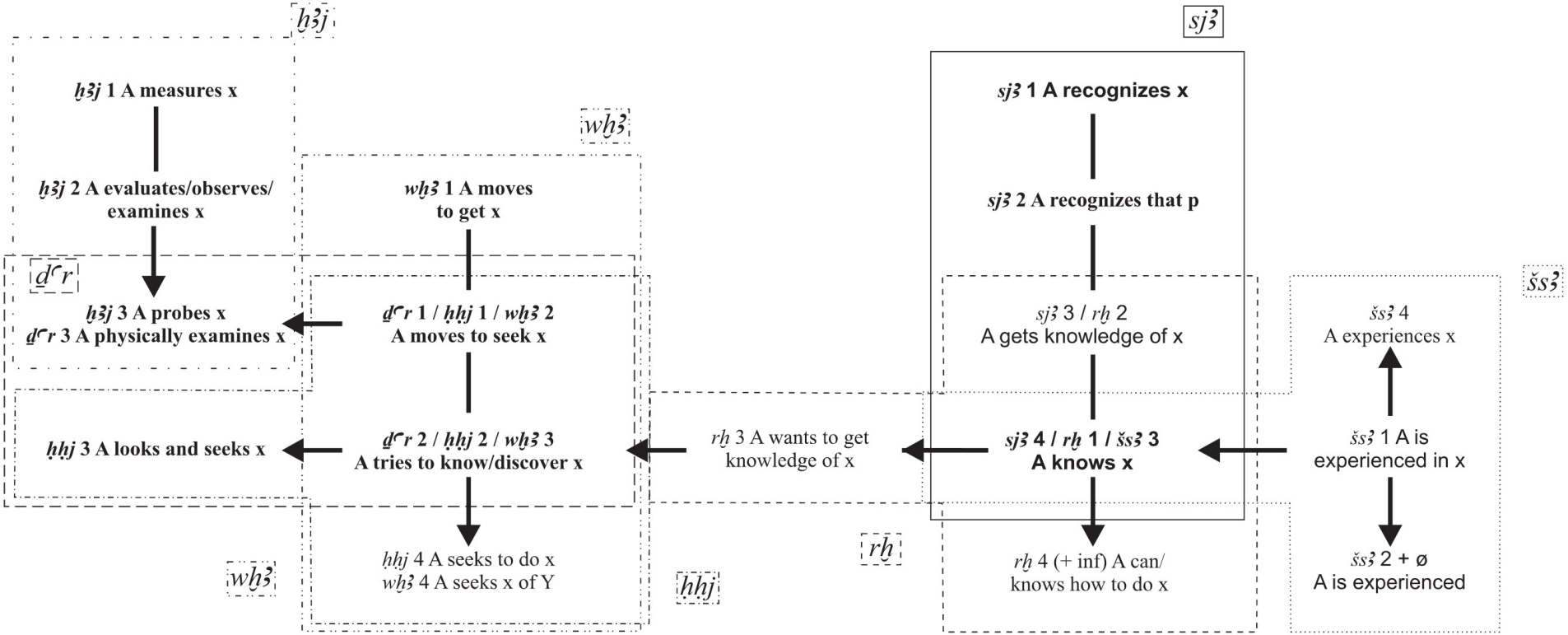
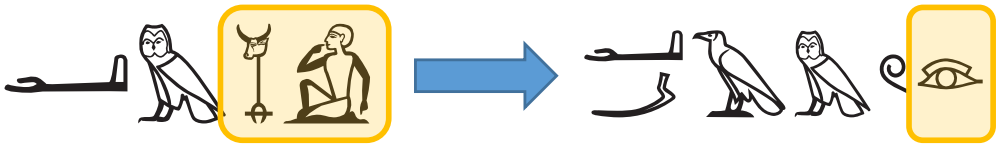


resultative achieved achieved **achieved / unachieved** unachieved



Perception and cognition – Ancient Egyptian

Chantrain (2014: 45–46) and Chantrain and Di Biase-Dyson (2017: 52–53) noted that the evolution of the classifiers in the writing system reflects a semantic change, from ‘to swallow’ to ‘to learn, know’



‘to swallow’

‘to learn, know’

Cf. Coptic ϵIMϵ

Perception and cognition – Ancient Egyptian

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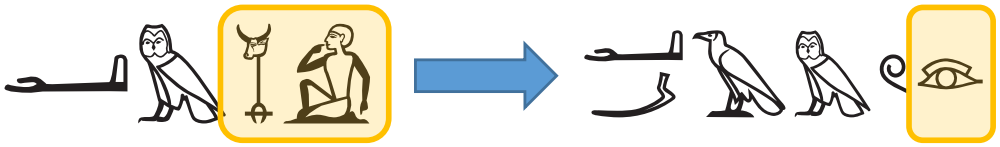


‘to swallow’ ‘to learn, know’

Cf. Coptic ϵιмϵ

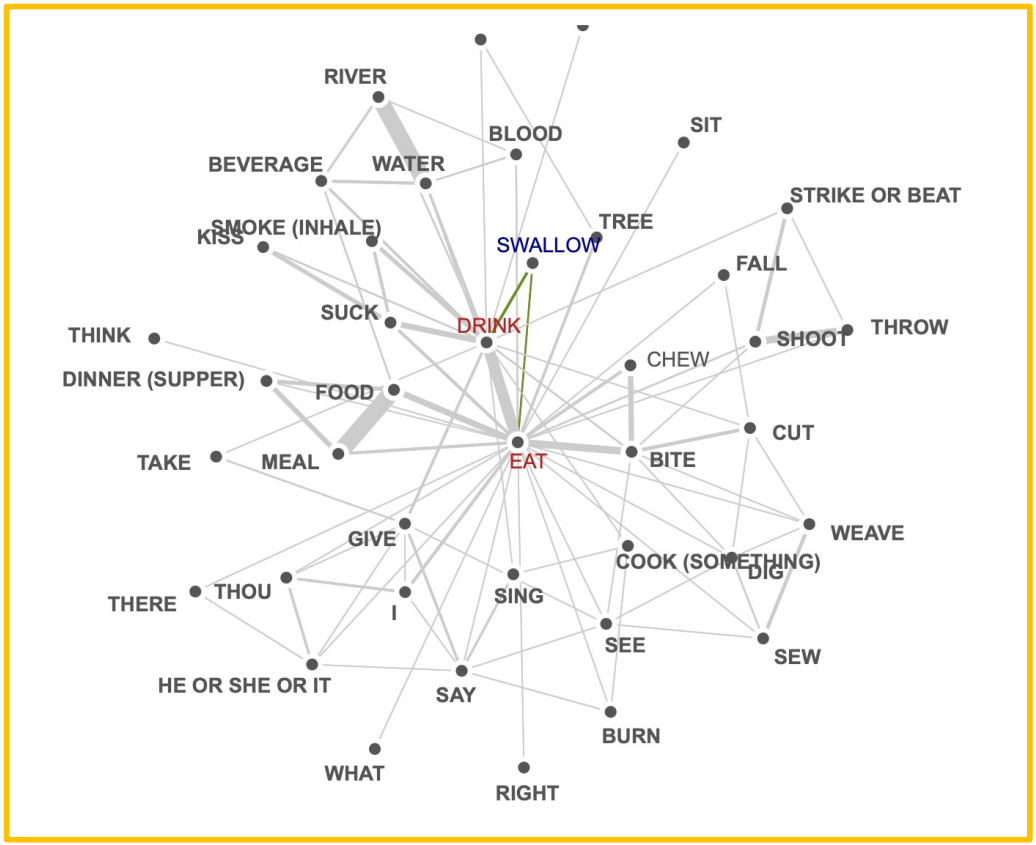
Steinbach-Eicke (2017: 385) states that the meaning ‘to know’ is typologically well established for lexemes having to do with food acquisition.

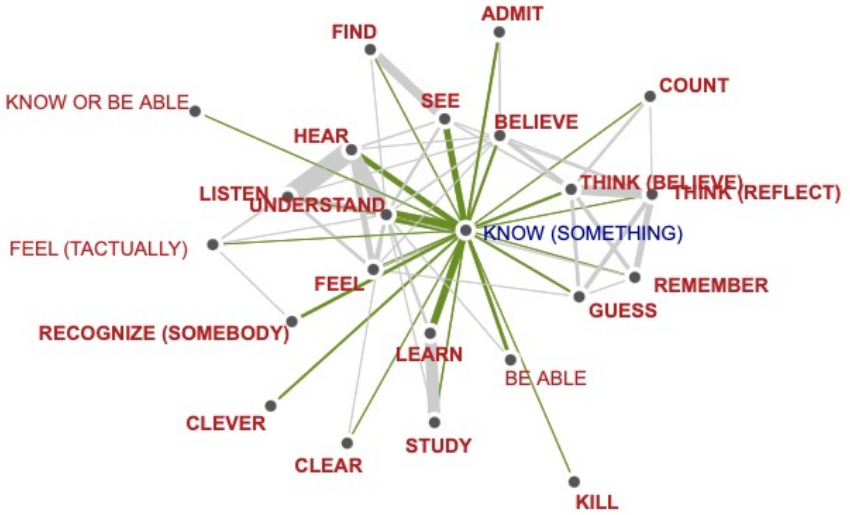
IDEAS ARE FOOD

What he said *left a had taste in my mouth.* All this paper has in it are *raw facts, half-baked ideas, and harmed-over theories.* There are too many facts here for me to *digest* them all. I just can't *swallow* that claim. That argument *smells fishy.* Let me *stew* over that for a while. Now there's a theory

Lakoff & Johnson (2003: 47)

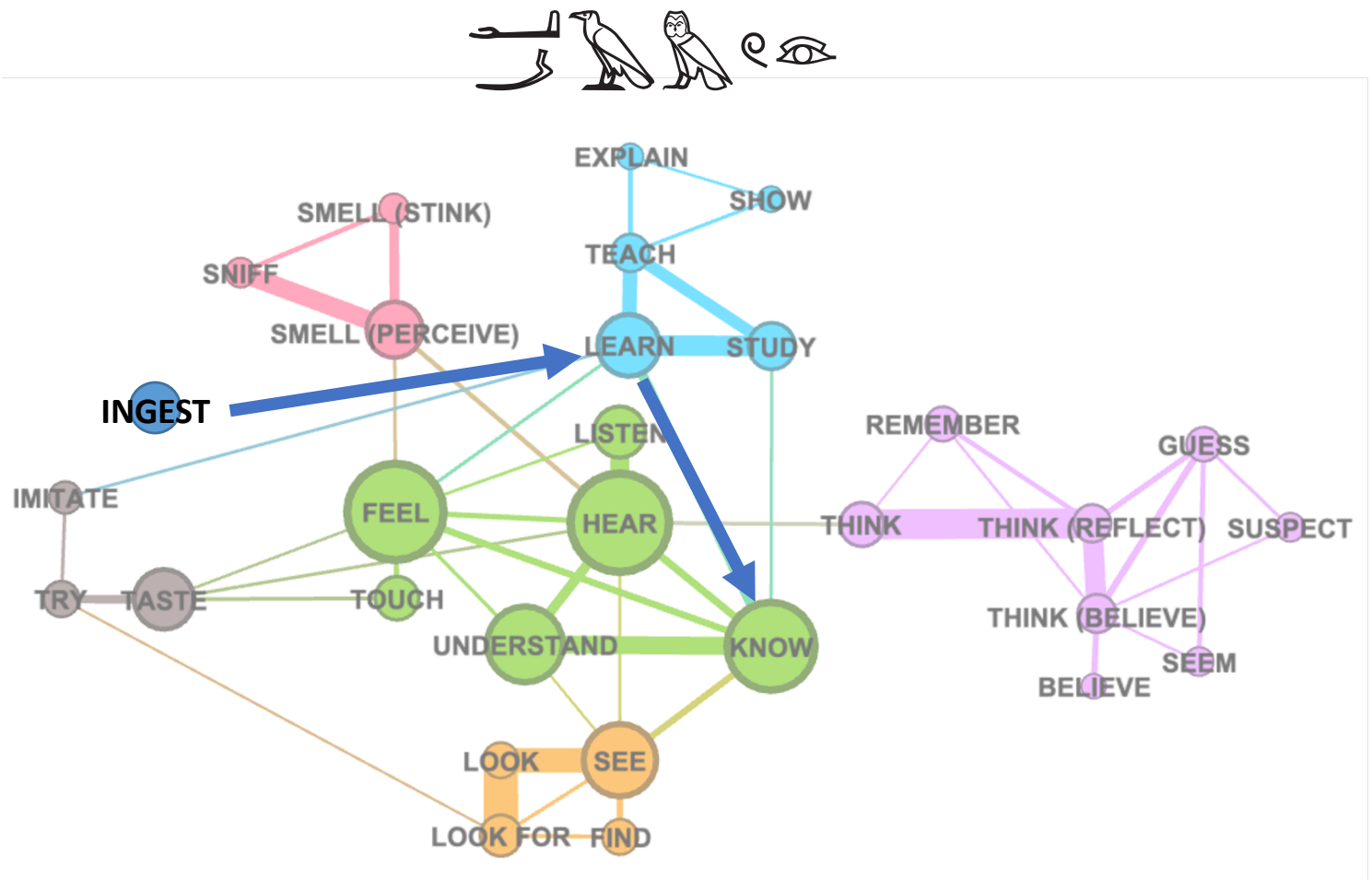
Perception and cognition – Ancient Egyptian



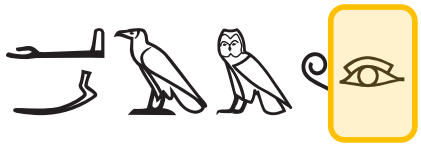


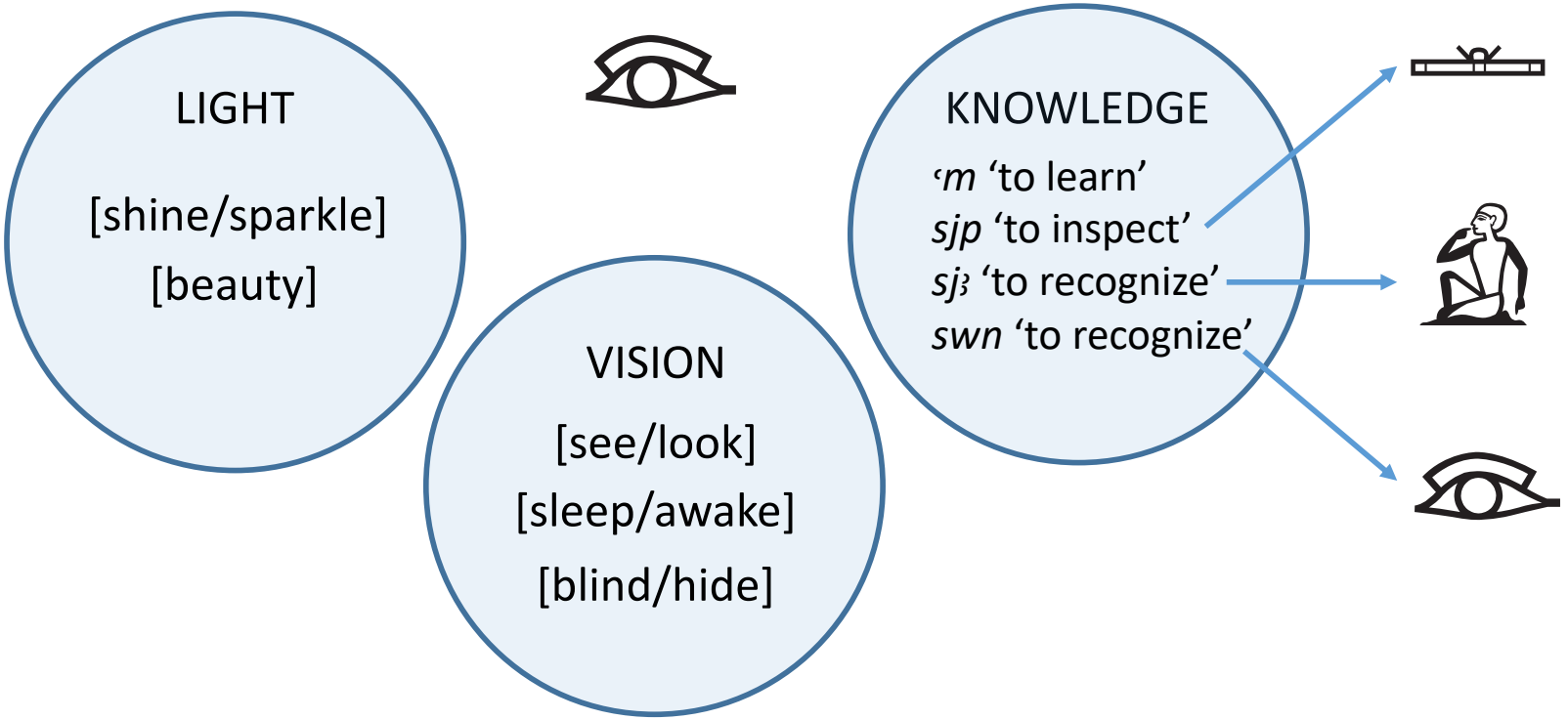
But see Spanish *saber* to know, to taste from Latin *sapere* 'to taste'

Perception and cognition – Ancient Egyptian



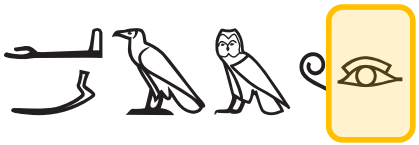
Perception and cognition – Ancient Egyptian



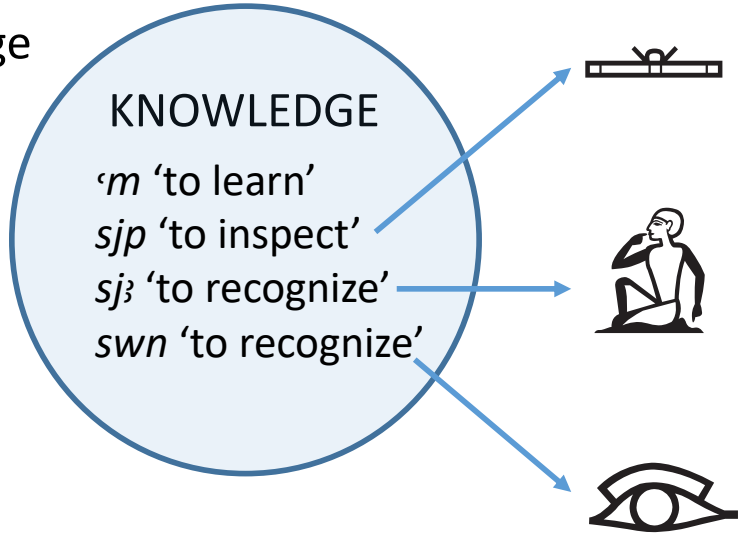


Bojowald (2011, 2018)
Pulicani (2015)
Grässler (2017)

Perception and cognition – Ancient Egyptian



Emergence of a new category for knowledge acquisition during the Ramesside Period (1150–1000 BCE)



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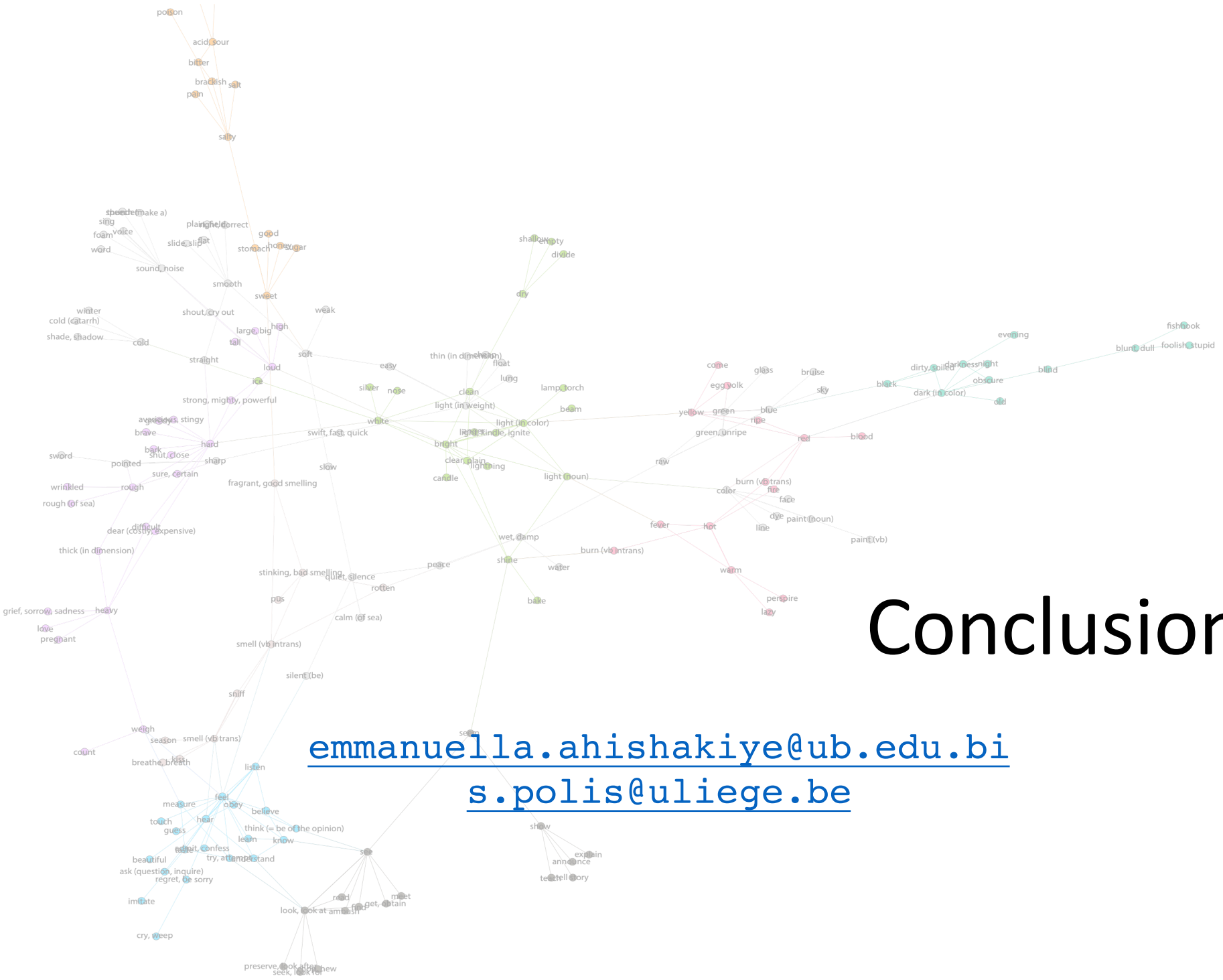

Conclusions

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s.polis@uliege.be